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APPLIED EPIDEMIOLOGY IN A GENERAL HOSPITAL

M. E. BARNES, M.D., DR.P.H.

IOWA CITY

Epidemiology has been defined by Hirsch[1] as "a science which will give, firstly, a picture of the occurrence, the distribution and the types of the diseases of mankind in distinct epochs of time and at various points of the earth's surface; and, secondly, will render an account of the relations of these diseases to the external conditions surrounding the individual and determining his manner of life."

As applied to a small community, such as a general hospital, it is with this second phase that epidemiology is concerned chiefly. Among its primary objectives become the exposing of the transmission paths of disease, or the recognition of conditions which may affect adversely the health of this particular community. Although such studies ordinarily are prompted only by the occurrence of actual cases of illness, there is no necessary reason why this should be so. If the epidemiologic approach is to have preventive application, potential hazards must be considered to be equal in importance to those which may have resulted in demonstrable actual damage. The mere fact that a fire has not occurred does not lessen the importance of searching for and eliminating fire hazards. The fact that no one has yet been killed does not warrant neglecting the hazards of accident. Unless we adopt the preventive point of view in epidemiology we will go along with smug satisfaction, thinking that all is well because no epidemic has occurred. Yet sporadic cases demonstrate as effectively as do epidemics that paths of transmission are open. By careful study of these cases we should be able to detect and to control the transmission paths, thus effectively preventing or limiting epidemic outbreaks.

ANCIENT METHODS

The epidemiologic possibilities become evident if we strip the veneer from the modern hospital and consider some of its basic features. Herodotus, speaking of ancient Babylon, said that the sick were carried to certain streets, where those who passed by inquired concerning their ailments. If any one had suffered a similar affliction, he told the sufferer what remedy or mode of treatment had proved beneficial in his own case. It was illegal for a visitor to refuse to listen to the recital of complaints as made by the patients. At various temples of antiquity a somewhat similar procedure developed, except that the patients inquired of the deity to whom the temple was dedicated, or they slept in the presence of the sacred image. Later, special porticoes or pavilions within the temple area were provided where the sick were permitted to place their beds and where they were cared for by members of their own family. Eventually there appeared a group of individuals who specialized in knowledge concerning the relief of suffering and who were the forerunners of our medical profession of today.

In these ancient centers where the sick were concentrated the following features may be noted: (1) the patients, (2) the families of the patients acting as practical nurses, (3) the throngs of passers by, (4) the vehicular and animal traffic, e. g. ox-carts, beasts of burden, dogs and other small animals which passed to and fro along with the human traffic, (5) the food venders, who carried viands kept warm by means of small charcoal burners, (6) the water carriers, usually slaves, who in jars or skins brought water for drinking or other purposes, and (7) the scavengers, usually slaves, who removed receptacles of excreta and other filth.

These various features are mentioned because, stated thus, one can see at once how much the patient was in contact with the entire community, the epidemiologic possibilities of such contact being quite obvious.

THE MODERN HOSPITAL

Yet these various features have their counterpart today. The modern hospital is but a hotel where sick folk may live and where facilities are provided for convenience in administering personal care and treatment. The street of antiquity has given place to the corridor along which today, as in ancient times, passes a constant stream of traffic, e. g. nurses, maids, orderlies, patients, physicians and interns, visitors. In one 900 bed state hospital studied, approximately 900 individuals are directly involved in its operation. The average daily census of patients is 742. The outpatients return to the various services at an average rate of 100 daily. The visitors average 400 daily. This hospital, in reality, is a small village with a population on any given day of well over 2,000 persons. Thirty-minute counts of pedestrian traffic were made over an interval of ten days, the counts being made at staggered periods which excluded the mealtime rush. In the main corridor along which the bulk of the traffic moves, individuals passed the observation point, during the time periods recorded, at a rate of more than 400 an hour.[2]

The traffic in the corridors of the patient floors is considerably less, but when one adds the activities of the 400 visitors to those of the personnel engaged in

From the Department of Hygiene and Preventive Medicine, State University of Iowa College of Medicine.

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1. Hirsch, August: Handbook of Geographical and Historical Pathology, London, New Sydenham Society, 1883.

2. Rooks, Ronald: Air-Borne Transmission of Disease, to be published.

the routine service of the hospital the traffic at any floor level is surprisingly heavy.

The vehicular traffic in hospital corridors is by no means negligible, e. g. patient carts, wheel chairs, laundry, diet and scrub carts. For the food vender of antiquity, we substitute the diet kitchen staff with its distribution carts. Water carriers and scavengers in the modern hospital have been supplanted only in part by plumbing systems. The direct handling of objectionable matter cannot be eliminated entirely. It is a curious fact also that the modern hospital preserves a physical similarity to the ancient one in its pattern. The individual rooms designed for the sickest patients open directly on the corridor, i. e. the street. The wards are but blind streets, separated from the thoroughfare by short hallways, oftentimes with service rooms on either side.

HEALTH HAZARDS

If this comparison with the ancient hospital is kept in mind, it is easy to visualize epidemiologic possibilities which otherwise tend to be obscured by the elaborateness of the modern institution. We must consider the general hospital to be a concentration point for individuals of lowered resistance. In either their present or past illnesses these patients often contribute to the hazards of their new environment. On the other hand they may be subjected at this concentration point to increased health hazards, which include a fair sampling of the transmissible diseases current in the community in which the hospital is situated. It must be remembered that all of the personnel engaged in the operating of a hospital have their homes in that community and participate in the various community activities. As a consequence, the separation between the hospital patients and the community is more imaginary than real. This is true of all hospitals, the difference lying chiefly in volume. The basic problems are common to all.

Entrance into a hospital is occasioned by the illness of the patient and, ordinarily, some element of urgency is involved. Under these conditions, except for cases of recognized communicable disease, epidemiology is usually most remote from the present interest of either the patient or the attending medical or surgical staff. The patient desires relief, not epidemiology. Thus, quite unawares and unintentionally the patient may introduce infections which interfere with the functions of the hospital even though they may not happen to result in important damage. The epidemic of scarlet fever and of hemolytic streptococcus infections in a maternity ward recently described by Diddle, Trussell and Plass [3] was brought about by an expectant mother who was admitted to the maternity ward with an infection of the upper respiratory tract following exposure to scarlet fever in her own community. No one had any knowledge of this exposure until several weeks later, when the epidemiologic studies brought this point to light.

A child was brought to the orthopedic service, having been previously exposed at home to chickenpox. In the absence of knowledge of such exposure, he was placed in a small ward with the result that several cases of this disease developed among children in that group. In a distant ward two additional cases developed in children who possibly may have received their infection from him, although the channel through which such infection passed was not definitely proved. The development of eruptive disease in children encased in plaster casts complicates the problem of their care.

Repeatedly, children have been received who at the time were in the incubatory stage of measles. Prior knowledge of exposure to this disease does not always exist, but accurate histories relative to previous attacks enable one quickly to locate the susceptible, should a case of the disease develop. With such knowledge, immediate and effective measures are possible to prevent or to reduce the severity of the disease in the susceptible group.

On various occasions, individuals ill with other diseases have been admitted in ignorance of the fact that they were typhoid carriers. One need not dwell on the risk involved in handling such cases in the general wards, at least without adequate precautionary attention on the part of those immediately involved in their care. It would seem logical that all persons who have ever had typhoid and all patients with gallbladder disease should be studied to ascertain whether they are typhoid carriers.

It is common knowledge that in a general hospital which does not accept known cases of pulmonary tuberculosis the nurses and interns develop infections, as is indicated by the change in their reactions to the Mantoux test. As this change is not shared to a comparable degree by the students of the same age group in the same community, there is reason to suspect that patients with whom they are in contact may be spreaders of the disease. Obviously, patients with open tuberculosis who gain admittance to a general hospital bring their infection with them and add to the hazards of their new environment.

The hazards to patients in the new environment may be connected with the physical or routine aspects of the hospital. Recently, during the routine testing of the circulating ice water in a general hospital, evidence of contamination was found. Investigation disclosed that one of the services requiring cool water for washing some films had attached a rubber tube to the ice-water tap and led the water to the bottom of a small vat. With an open faucet valve, this constituted a perfect setup for back siphonage when and if a negative pressure developed in the water line. Evidently some back siphonage had taken place. Although in this particular instance no known damage resulted, numerous possibilities for back siphonage exist in most hospitals unless very painstaking search has been made to ensure their elimination. In one hospital it was necessary to install more than 600 vacuum breakers to eliminate potential back siphonage.[4] Even so, the human element is difficult to control. In the laboratories, individuals who are unfamiliar with the possibilities of back siphonage are very likely to set up apparatus which creates the conditions for such development. In other instances, individuals may interfere with corrective devices. For example, an air breaker was installed on a bed pan washer to make back siphonage impossible. A student nurse who disliked the noise restored the original hazard by the liberal application of adhesive tape to the air breaker.

However, most of the hazards are connected with individuals rather than with mechanical devices. Godfrey and Pond [5] recently reported a small epidemic of Flexner dysentery caused by contamination of the ice supply in a hospital. The situation which they described exists in most hospitals, and the hazards are increased

3. Diddle, A. W.; Trussell, Ray E., and Plass, E. D.: Scarlet Fever in Obstetrics, Am. J. Obst. & Gynec. **39**: 608-617 (April) 1940.

4. Baxter, A. C.: Personal communication to the author.

5. Godfrey, E. J., and Pond, M. A.: A Hospital Epidemic of Flexner Dysentery Caused by Contaminated Ice, J. A. M. A. **114**: 1151-1154 (March 30) 1940.

whenever ambulant patients are given access to the service rooms, as not infrequently is the case when they are rendering assistance to other patients.

Perhaps the center of greatest potential danger to any hospital is its otolaryngology service. Many of the operative cases there represent sequelae to some infectious disease. Hemolytic streptococci abound in the draining lesions of such patients. Many patients are children who, because of the difficulty of controlling them, may spread their infections to others. Scarlet fever, streptococcic sore throats and erysipelas are among the infections which result. In one instance investigated a series of five patients with scarlet fever and one with hemolytic streptococcus sore throat were shown to have had close contact with a patient suffering from discharging ears. When a culture was found positive and the patient was removed to isolation, further infections ceased.

That visitors may introduce infections to the patients whom they visit is an obvious possibility. The wonder is that such infections are not more numerous than they are. It is through the visitors and the employees that the patients share directly in the current health problems of the community. Recently a child in the orthopedic ward was visited by his father, who, as was ascertained later, was suffering from mumps at the time of his visit. In due time the child developed mumps, as did four other children with whom he was playing in the ward.

RESPONSIBILITY OF THE HOSPITAL

The general hospital, being a concentration point for the community illnesses, has also an opportunity and a responsibility to serve the community along the lines of epidemiology. A patient from another city entered the hospital suffering from amebic dysentery. In connection with his history, special attention was paid to epidemiologic aspects. It was found that he worked as a cook at one restaurant and his wife was employed at another. It became the duty of the hospital to acquaint the local health authorities with the situation in order that appropriate decisions might be made.

A woman who entered with chronic bacillary dysentery gave a history of working as a pastry cook in the dining service of a small college. In releasing such a patient to return to the same danger point, the hospital would assume a responsibility which it has no right to assume. The local health authorities should decide the conditions under which she may resume her occupation.

A woman entered the hospital for a small operation, received appropriate and successful treatment, and was discharged. On her history sheet, among the past diseases, appeared a record of typhoid suffered many years previously. Scant attention appears to have been paid to this item and, if any laboratory studies were made, it is not a matter of record. This is unfortunate, because within a few years she was proved to be the source from which an epidemic of typhoid developed. At that time there was reason to believe that she had been a carrier for many years. An epidemiologic study of the patient at the time of hospitalization might have resulted in averting the calamity.

Recently a group of five students from various parts of a university community entered the isolation hospital suffering from scarlet fever. A sixth student, daughter of a physician, was taken home by him because of the same disease. Through epidemiologic investigation of these cases it was learned that the one common activity was the eating of meals at a certain restaurant within the incubation period of their disease. In gathering this information, a clue was secured as to two possible concealed cases among the employees. The local health officer, on being acquainted with the situation, confirmed the presence of the two affected employees and forced their isolation.

An epidemiologic service in a general hospital affords an opportunity for gaining experimental knowledge as to the mode of spread and practical methods of control of the various diseases studied. Propinquity does not necessarily mean effective exposure. Aerial transmission even within the same room is not so frequent as one might suppose. The studies of Rooks [2] and of MacDonald [6] suggest that one might remain in a scarlet fever ward for as long as six hours before inhaling a single hemolytic streptococcus. Except when viruses are concerned, the direct implantation of the causative organisms appear usually to be a prerequisite for the spread of upper respiratory infections. By basing measures on this hypothesis it is possible oftentimes to effect a satisfactory degree of control without closing wards except for the time required for the investigation.

These brief illustrations typify what one may expect to find in any general hospital if epidemiologic study is made of the patients, personnel and hospital environment.

Responsibility for such studies should be centered in some one individual, who should have access to all services of the hospital, who will coordinate such investigations as may be necessary, and who will receive the fullest support from the heads of the departments concerned. It is feasible to report to him all cases of evident epidemiologic importance and to seek from him advice as to cases of dubious status. Responsibility should be placed on him to investigate the potential health hazards existing in the institution. When actual cases of communicable disease develop in the hospital, the affected wards should be closed as a matter of routine until his investigations have been made. His should be the responsibility of deciding on the measures needed to ensure that the hospital's functions may proceed safely and with the least possible delay. One of his duties should be to train the interns to recognize the epidemiologic possibilities in the situations faced and in the patients handled.

Centralization of responsibility is advisable because epidemiologic trails cross artificial boundaries in the hospital just as they do in larger communities. The individual case may develop in one ward but the trails may lead anywhere throughout the hospital or even into the surrounding community. Moreover, hospital epidemiology is quite complicated. The constant flow of visitors, the shifting of hospital personnel from ward to ward, the ingress and egress of patients tend to obscure the trails which a disease may have followed. However, in the absence of some great calamity we shall remain ignorant of the potential health hazards in these institutions until we make a serious attempt to uncover these trails. In particular instances we may fail to solve the epidemiologic problems. In fact, we may expect such failures to outnumber the successes. Nevertheless, in the effort to solve these problems we are certain to find potential transmission paths which need to be guarded, and we can work out procedures adapted to the existing situations which will reduce to the minimum the health hazards suggested in this discussion.

6. MacDonald, Kenneth: Air-Borne Beta Hemolytic Streptococci: A Scarlet Fever Epidemic, Am. J. Hyg. (Sec. B) **31**: 88 (March) 1940.

SUMMARY

As applied to a small community, a primary objective of epidemiology is the exposing of the transmission paths of disease or of conditions effecting adverse mass action in that community. Although such studies ordinarily are prompted by the occurrence of actual cases, there is no necessary reason why this should be so. If the epidemiologic approach is to have preventive application, potential hazards must be considered of epidemiologic importance whether or not resulting in demonstrable actual damage. The general hospital is a concentration point for individuals of lowered resistance. In either their present or past illnesses, these patients oftentimes contribute to the hazards of their new environment. On the other hand, in their lowered state of resistance they may be subjected at this concentration point (hospital) to increased health hazards representing a fair sampling of the diseases prevalent in the entire community.

Health hazards originate in patients, visitors, the hospital personnel or in the physical setup of a hospital. Because of their sporadic occurrence, attention usually is not directed to the avenues whereby infections are transferred. Thus these transmission paths remain undetected even though open. In a general hospital of moderate size the problems encountered justify placing the responsibility for current epidemiologic service on some definite staff member for the better protection of the patients, of the hospital personnel and of the community.

ABSTRACT OF DISCUSSION

Dr. W. G. Smillie, New York: Dr. Barnes's conception of a modern hospital corridor as the arcade of a busy city is appropriate. The analogy applies also to certain other institutions, such as universities and large factories. These cohesive, closely knit units of our social fabric offer excellent opportunities for epidemiologic study. Dr. W. H. Welch defined epidemiology as "the study of the natural history of disease"; thus there is an epidemiology of cancer and of heart disease, as well as of dysentery and tuberculosis. There is an epidemiology of industrial accidents as well as an epidemiology of syphilis. Whenever groups of people are living and working in small, integrated social units, subjected to uniform environment, their activities and their contacts so controlled that they may be subjected to exact appraisal and analysis, conditions are ideal for epidemiologic study. It is generally believed that a successful epidemiologic study requires a massive accumulation of data, which will be appropriately analyzed and interpreted. The fallacy of this conception was emphasized years ago by Ezra Hunt, at the first meeting of the American Public Health Association in 1872, who said: "A great number of cases to observe is in some respects valuable, but confusion and difficulty of study sometimes arise from too great aggregation of disease under the extra artificial conditions of cities (contagious disease) hospitals, and so forth, and very much is to be learned from a few typical cases occurring under circumstances less complicated. There is often not so much to be learned by observing a very great number of cases as by an exhaustive searching into a few cases, all the facts of which are more within the grasp." In his paper, Dr. Barnes has applied the criteria of Ezra Hunt.

Rural Health Administration.—The establishment of local boards of health represents the first official attempt to attack rural health problems in America. These boards have been in existence for more than one hundred years and in some rural areas they still function in very much the same manner as they have through the generations. The first local boards of health were established in Massachusetts in 1797. Connecticut followed in 1805.—Smillie, Wilson G.: Public Health Administration in the United States, New York, Macmillan Company, 1940.

PERFORATING GUN SHOT WOUNDS OF THE ABDOMEN

AN ANALYTIC STUDY AND STATISTICAL REVIEW OF TWO HUNDRED AND NINETY-TWO CASES

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Injuries and deaths resulting from gun shot wounds should be of vital interest to every one, since at the present time over half of the world is engaged in war and the peace of the rest of the world hangs by a thread. Perforating gun shot wounds of the abdomen should be of special interest to the general surgeon because the mortality rate has not been greatly lowered during the past twenty-five years and, therefore, this type of injury remains the most effective method of killing. Although surgical judgment and technic have improved, there has also been a corresponding increase of 20 per cent in the velocity of the bullet, which causes more damage to the abdominal organs. Fortunately, the incidence in civil practice is rare.

MATERIAL REVIEWED

This paper is based on a study of 292 cases of gun shot wounds of the abdomen with visceral perforations which occurred in Nashville, Tenn., during the period of 1923-1939. Of the twenty-four cases in which exploration was not done there were twenty-three deaths, or a mortality of 95.8 per cent. However, of 268 cases in which exploration was done there were 166 deaths, or a mortality of 61.9 per cent. This is quite high, but not far out of line with the reports of other surgeons reporting on a large series from general hospitals. It should be emphasized that only those cases were considered in which there were visceral perforations, whereas in most reviews cases are included in which the abdominal wall and peritoneum had been penetrated without visceral perforation. By including the cases without perforation the mortality would obviously be lower.

After studying the peace time reviews of cases that occurred during approximately the same period as covered by this review, and including only cases in which a viscus was perforated, and further including only the series in which the total number of cases was over 100, it was discouraging to discover that the operative mortality remains approximately 60 per cent. This was found to be true of the report of Taylor[1] of Indianapolis, Loria[2] of New Orleans, Mason[3] of Birmingham, Ala., and Oberhelman and LeCount[4] of Chicago, as well as the combined statistics of men reporting cases from Charity Hospital of New Orleans. One of the few exceptions to this is the report of Billings and Walkling,[5] reporting 114 cases from Philadelphia with an operative mortality of 48.2 per cent. This is the only large series reviewed showing an operative mortality below 50 per cent. There were

Read before the Section on Surgery, General and Abdominal, at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

1. Taylor, Frederic W.: Gun Shot Wounds of the Abdomen, J. Indiana M. A. **31**: 342-345 (July) 1938.
2. Loria, F. L.: Visceral Injuries in Gun Shot Wounds of the Abdomen, New Orleans, M. & S. J. **80**: 283-289 (Nov.) 1927.
3. Mason, J. M.: The Influence of Hemorrhage on the Mortality in Gun Shot and Other Injuries of the Abdomen, Ann. Surg. **79**: 382-385 (March) 1924.
4. Oberhelman, H. A., and LeCount, E. R.: Peace Time Bullet Wounds of the Abdomen, Arch. Surg. **32**: 373-412 (March) 1936.
5. Billings, A. E., and Walkling, Adolph: Penetrating Wounds of the Abdomen, Ann. Surg. **94**: 1018-1043 (Dec.) 1931.

found several small series of selected cases in which the mortality was below 50 per cent, but these could not be called representative of the true state of affairs. For example, a review of the operative mortality at the Nashville General Hospital for one year gave only 35.7 per cent.

Since the mortality still remains high, we have tabulated and attempted to evaluate the results in this study, to the end that some conclusion may be reached as to the lack of progress in lowering the mortality.

The type of weapon used, the age, sex, color of the patients, and the viscera or vessels perforated are all factors influencing the mortality which are beyond the surgeon's control. However, the promptness of preparation for operation, choice of anesthetic, operative technic, length of procedure and preoperative and postoperative management are factors in the lowering of mortality that are under the surgeon's control.

INCIDENCE

The incidence of gun shot wounds of the abdomen is rare in most parts of the country as revealed by the statistics from the Metropolitan Life Insurance Company. However, in Nashville it ranks as one of the most frequent emergencies seen in the charity hospitals and occurs with six times the frequency of ruptured gastric ulcer and twice the frequency of ruptured duodenal ulcer. The number of cases has steadily increased in Nashville during the past fifteen years, and by grouping the cases in five year periods and comparing them, it was found that the incidence has increased 100 per cent, although during this period the population of the city has increased only 16 per cent (table 1).

It has been repeatedly said that the smaller the caliber of the rifle or pistol the lower the mortality, and this fact is borne out in the present review. Seventeen persons were shot with a 0.22 caliber rifle with a mortality of 41.1 per cent, 241 shot with pistols of larger caliber than 0.22 with a mortality of 63.4 per

TABLE 1.—*Comparative Study of Incidence*

Year	Total	Died	Lived	Mortality
1923-1924	14	10	4	71.4
1925-1929	60	36	24	60.0
1930-1934	97	64	33	65.9
1935-1939	121	79	42	65.2
Total—17 years	292	189	103	64.7

TABLE 2.—*Type of Weapon, with Mortality*

Weapon	Total	Died	Lived	Mortality
Pistol	241	153	88	63.4
Shot gun	34	29	5	85.2
Rifle	17	7	10	41.1

cent, and thirty-four injured by shot guns with a mortality of 85.2 per cent. The reason for the high mortality from shot guns was that most of these cases were attempted murder, shot at close range and tearing large holes in the viscus, making most of the wounds almost impossible to repair (table 2).

AGE, SEX, COLOR

The youngest person was 5 years of age and the oldest was 80 years of age, but the greatest number, 125, or 42.4 per cent, occurred between the ages of 21 and 30. It was interesting to note that the mortality increased steadily with the decades of life, the lowest rate, 50 per cent, occurred in the age group of 1-10 and the highest rate of 85.7 per cent between the ages of 61 and 70 (table 3). The lower mortality rate in the younger group could be accounted for by the fact that most of the accidental injuries from 0.22 rifles

TABLE 3.—*Occurrence in Different Decades with Mortality*

Decade	Total	Died	Lived	Mortality
1-10	6	3	3	50.0
11-20	50	29	21	58.0
21-30	125	76	49	60.8
31-40	61	42	19	68.8
41-50	29	23	6	79.3
51-60	11	9	2	81.8
61-70	7	6	1	85.7

TABLE 4.—*Color and Sex with Mortality*

Class	Total	Died	Lived	Mortality
Colored male	150	95	55	63.3
White male	93	64	29	68.8
Colored female	36	21	15	58.3
White female	13	9	4	69.2

were in this group. Also the increased stamina of youth probably enhanced the chances of recovery.

Similar to other reports, the greatest number of patients in our series were males, 243, or 83.2 per cent; forty-nine, or 16.8 per cent, were females. Ranked as to frequency there were 150 colored males, or 51.3 per cent, ninety-three white males, or 31.9 per cent, thirty-six colored females, or 12.4 per cent, and thirteen white females, or 4.4 per cent (table 4). It has been believed that owing to the well developed muscles of the average colored person as contrasted with white persons there is a lower mortality in the colored as the result of the fact that the bullet might be partly spent before it entered the abdominal cavity and was therefore not capable of doing as much damage. This assumption seems to have been supported in this review, as the mortality in the colored race was 62.3 per cent as contrasted with 68.8 per cent for the white race (table 5).

It was shown also that females tolerated abdominal injuries resulting from gun shot fire better than males, and the mortality in the female was 61.2 as against 65.4 per cent for the male.

ADVANTAGE OF EARLY OPERATION

The improvement in transportation has made it possible for the injured to arrive at the hospital within a short period of time, but it seems that there is still too much delay in the beginning of the laparotomy. This, in part, may be due to the fact that most of our cases came at night or on holidays when the efficiency of the personnel of the hospital was at the lowest ebb. Another factor that might have contributed to the delay was that the patient was usually first seen by an inexperienced intern who might not have fully appreciated the seriousness of the condition and might have underestimated the degree of shock.

Preliminary x-ray examinations may be of value in the determination of the possibility of questionable entrance into the abdominal cavity, but as a routine procedure this should be discouraged because of the imposed preoperative delay and the added moving and handling of patients, many of whom are in an extreme

degree of shock. The statistics in this review show that, the earlier the patient was operated on, the greater the chance of recovery. From an analysis of the records of 112 patients who were first seen in the outpatient department of one of the hospitals, it was found that of those in a serious condition and dying within six

TABLE 5.—*Comparative Study of Color and Sex*

Classification	Total	Died	Lived	Mortality
Colored male and female	186	116	70	62.3
White male and female	106	73	33	68.8
Colored male and white male	243	159	84	65.4
Colored female and white female	49	30	19	61.2

TABLE 6.—*Length of Time Before Operation, with Mortality*

Hours	Number	Died	Lived	Mortality
0-2	115	69	46	60.0
2-4	83	52	31	62.6
4-6	20	13	7	65.0
6-9	14	10	4	71.4
Over 9	10	6	4	60.0

hours of admittance to the hospital 30.7 per cent had been given x-ray examinations. I believe that this loss of time necessary for preliminary x-ray examination contributed more to the mortality of these patients than was justified by the diagnostic aid to the surgeon at the time of exploration, for the experienced surgeon regularly examines all of the intestinal tract.

Accurate data were kept on the length of time elapsing from the receipt of injury to the beginning of the operation and showed convincingly the advantage of early operation; for in those operated on within two hours the mortality was 60 per cent and the fatality rate increased steadily as time elapsed until with an interval of from six to nine hours the mortality was 71.4 per cent (table 6). After nine hours the mortality again was lowered to 60 per cent. Apparently this was due to the fact that large hemorrhage had not occurred in many of these cases.

AMOUNT OF HEMORRHAGE

It has been shown by Mason, by Loria [6] and by this study that the amount of hemorrhage is the greatest single factor in the determination of the mortality. Therefore, when a patient is seen in shock following gun shot injury of the abdomen it is safest to assume that this shock is due to actual blood loss and prepare the patient for exploration as soon as the blood pressure has been raised to a level at which a laparotomy can be fairly safely performed. However, this opinion is not shared by all and there have arisen two schools of thought in the management of such patients, the first, as already advocated, treating the patient for shock in the operating room and performing exploration at the earliest possible moment to check active hemorrhage, the second assuming that the shock is primary and deferring operation for several hours while combating shock.

The presence of blood in the abdominal cavity was recorded in 222 cases in the series under analysis. The amount of blood was estimated by the surgeon as large, moderate or small. We have used the same classification as other men have used; namely, large hemorrhage group 1,000 cc. or more, moderate hemorrhage from 500 to 1,000 cc., small hemorrhage 500 cc. or less.

There were 112 cases in the large hemorrhage group, with a mortality of 83.9 per cent (table 7).

In the moderate hemorrhage group there were forty-eight cases with a mortality of 60.4 per cent and sixty-two cases in the small hemorrhage group with a mortality of 43.5 per cent. This study shows convincingly that the amount of hemorrhage is the greatest individual factor in the mortality irrespective of the organ damaged.

VALUE OF TRANSFUSION

It was a difficult task to find suitable donors in a short period of time, as there were no available funds for the use of professional donors at the Charity Hospitals, where the greatest number of these cases occurred. However, ninety-nine (30.4 per cent) of the 292 patients were given transfusions for from one to ten times, which affords a sufficient number of cases to study the value of this procedure.

In the large hemorrhage group forty-seven, or 41.9 per cent, of the total group were given transfusions with thirty-five deaths, or a mortality of 74.4 per cent. In contrast to this there were the sixty-five cases in which transfusions were not given, with a mortality of 90.7 per cent (table 8). In this group the mortality was lowered 16.3 per cent by transfusion.

In the moderate hemorrhage group thirty patients were given transfusions, or 62.5 per cent of the total, with nineteen deaths, or a mortality of 62.3 per cent; but eighteen patients were not given transfusions, with ten deaths, or a mortality of 55.5 per cent. In this group there was no lowering of the mortality.

In the small hemorrhage group twenty-two, or 35.4 per cent, were given transfusions, with eight deaths, or a mortality of 36.3 per cent, as against forty not given transfusions, with nineteen deaths, or 47.5 per cent. In this group the mortality was lowered 11.2 per cent.

TABLE 7.—*Amount of Hemorrhage, with Mortality*

Amount	Total	Died	Lived	Mortality
Large	112	94	18	83.9
Moderate	48	29	19	60.4
Small	62	27	35	43.5

TABLE 8.—*Study of the Value of Transfusion*

	Transfused			Not Transfused		
Group	Number	Died	Mortality	Number	Died	Mortality
Large	47	35	74.4	65	59	90.7
Moderate	30	19	63.3	18	10	55.5
Small	22	8	36.3	40	19	47.5
Total	99	62	63.5	123	88	71.5

In the total it was found that of the ninety-nine given transfusions the mortality was 63.5 per cent; in the 123 not given transfusions the mortality was 71.5 per cent. Thus in those who received blood the mortality was 8 per cent lower than in those not receiving blood.

ORGANS PERFORATED

Next to hemorrhage the most important factor in the death rate is the organ or organs perforated. The mortality increases when more than one organ is per-

6. Loria, F. L.: The Influence of Hemorrhage in Abdominal Gun Shot Injuries, Ann. Surg. **96**: 169-178 (Aug.) 1932.

forated, as the number of holes and degree of destruction of the organs increase and as the site of perforation descends in the intestinal tract. The lowest mortality was in perforation of the liver, 44.4 per cent, and then the mortality steadily increased as the stomach, small intestine and large intestine were reached. The mortality of perforation of the large intestine was 65.9 per cent (table 9).

The small intestine was perforated most often, 136 cases with an average number of holes of 6.2, the large intestine next with eighty-nine cases giving an average number of holes of 2.5, and last the stomach with sixty-eight cases giving an average number of holes of 2.05.

TABLE 9.—*Mortality of Perforation of Different Organs*

Organ	Single Organ			Two or More Organs		
	Total	Died	Mortality	Total	Died	Mortality
Liver	18	8	44.4	33	22	66.6
Stomach	15	8	53.3	46	30	65.2
Small intestine	61	39	63.9	72	50	69.4
Large intestine	29	19	65.5	57	38	66.6
Spleen	6	3	50.0	5	5	100.0
Kidney	6	3	50.0	13	6	46.1
Bladder	2	..	....	12	9	75.0
Pancreas	..	..	....	3	1	33.0
Large vessels	..	..	....	4	4	100.0

OPERATIVE PROCEDURE

Simple closure is the best procedure for perforation whenever possible, for any attempt at resection is associated with high mortality. However, this becomes necessary at times when the blood supply to the intestine is destroyed or a considerable portion of the intestine is shot away. There were thirty-three cases in which a portion of the intestine was resected varying from several inches to several feet with twenty-seven deaths, or a mortality of 81.8 per cent. In case of severe damage to the movable portion of the large intestine it is advisable to bring the damaged portion outside the abdominal cavity rather than to try and do a resection. Six splenectomies with five deaths, or a mortality of 83⅓ per cent, were performed. There were also thirty-three cases with associated chest and abdominal injuries giving twenty-eight, or 81.7 per cent, mortality.

ANESTHETIC

Ether was the anesthetic of choice, as it gave the required relaxation not associated with very much shock. Spinal anesthesia was only occasionally used, as it causes too much drop in the blood pressure, which is often already at a dangerously low level. Another practical objection to spinal anesthesia is the fact that it may cause contraction of the intestine, forcing more of the intestinal contents out into the abdominal cavity. Local and gas anesthesia did not give the proper relaxation and made it necessary for the operator to fight the intestine, causing further shock and squeezing more material out into the peritoneal cavity. Ether was used in 244 cases, with a mortality of 61 per cent; in the remaining twenty-four cases in which local, gas or spinal anesthesia was used the clinical notes were insufficient for accurate statistical analysis.

Paradoxical as it may seem, the mortality decreased in inverse proportion to the length of the operation (table 10).

In the short operations of less than thirty minutes the mortality was 77.7 per cent, and the mortality was gradually reduced as the length of the anesthetic increased until the lowest rate was between ninety-one and 120 minutes, when the mortality was 54 per cent. After two hours the mortality again increased and this probably can be explained by the fact that the operator was exceedingly slow or there was a great deal of damage to repair. The high mortality in the operative group requiring less than one hour can be explained by the fact that, first, in the most serious cases death occurred within thirty or forty minutes; in nineteen of the operative cases, death occurred on the operating table. Secondly, the hasty operator is more likely to overlook perforations, and it is not of much value racing against time to close eight or ten perforations and leave one not closed. In the twelve autopsies performed in cases in which the operations had been completed, overlooked perforations were found in six, or 50 per cent, and four of these six, or 66⅔ per cent, were found in operations requiring less than one hour. It should be emphasized that slowness is not a virtue, but in an attempt to secure speed the operator should not sacrifice thoroughness.

TABLE 10.—*Length of Operation, with Mortality*

Time	Number	Died	Lived	Mortality
0 - 30 minutes	9	7	2	77.7
31 - 60 minutes	84	53	31	63.0
61 - 90 minutes	80	48	32	60.0
91 -120 minutes	50	27	23	54.0
121 -180 minutes	21	14	7	66.6

CAUSE OF DEATH

In the 189 cases in which death occurred, the time elapsed between the operation and death varied from a few minutes on the table to ninety-three days. The vast majority of patients died within twenty-four hours. It cannot be determined accurately whether a patient dies of shock and hemorrhage and when peritonitis supervenes, and there is undoubtedly an overlapping and combination of all these factors. I have arbitrarily classed those dying within twenty-four hours as dying of shock and hemorrhage, and those after twenty-four hours as dying of peritonitis or some other cause than shock (table 11).

Table 11 shows that in 59.8 per cent of the fatal cases the cause of death was shock and hemorrhage and in 29.6 per cent peritonitis. Only a small percentage of deaths were due to other causes. It is interesting to note that there were no records of any deaths from tetanus and only five from gas bacillus infection. In the last three years there have been no deaths due to gas bacillus infection. Shortly after sulfanilamide was given to the medical profession in this country it became my routine practice to use this agent in large doses intraperitoneally at the time of operation. This was supplemented by parenteral use of sulfanilamide

TABLE 11.—*Cause of Death*

Cause	Total	Mortality
Shock and hemorrhage	113	59.8
Peritonitis	56	29.6
Pneumonia	5	2.7
Gas bacillus	5	2.7
Other causes	4	2.2
Exhaustion	3	1.5
Intestinal obstruction	3	1.5

postoperatively. The prompt use of this drug was, I believe, undoubtedly of considerable value in combating infection.

Of the 103 patients who lived, the period of hospitalization varied from eight to 105 days, the average length of time being 29.1 days.

SUMMARY

1. Two hundred and ninety-two cases of gun shot wounds of the abdomen with visceral perforations were studied.

2. The smaller the caliber of the pistol or rifle, the lower was the mortality.

3. The mortality increased steadily with the decades of life.

4. The greatest number of patients were males, 83.2 per cent; 60.2 were Negroes.

5. The statistics in this review showed that, the earlier the patient was operated on, the greater was the chance for recovery.

6. The amount of hemorrhage is the greatest single factor in the mortality irrespective of organs damaged.

7. Ninety-nine patients were given transfusions and in this group apparently the mortality was lowered 8 per cent.

8. The mortality increases when more than one organ is perforated, as the number of holes and degree of destruction of the organ increase, and as the site of the perforation descends in the intestinal tract.

9. Paradoxical as it may seem, the mortality decreased in inverse proportion to the length of the operation.

10. Shock and hemorrhage accounted for the greatest number of deaths.

1913 Church Street.

ABSTRACT OF DISCUSSION

DR. ADOLPH A. WALKLING, Philadelphia: Whenever the abdominal wall has been penetrated by a bullet, exploration should be done. The patient may have signs of shock which may be due to fright, while the signs of perforation, such as pain, tenderness, rigidity and presence of air in the abdominal cavity, may be entirely lacking. When the patient is seen and his condition is satisfactory to withstand operation, no delay should be permitted. The most urgent problem is hemorrhage and it is difficult to differentiate hemorrhage and shock. At the Pennsylvania Hospital our mortality in the cases of severe hemorrhage was 61 per cent, in the moderate hemorrhage cases 39 per cent, and in the slight hemorrhage cases 26 per cent. The points made regarding multiple wounds and the fatal types of combined colon perforation with severe hemorrhage are well taken. That wounds in viscera may be overlooked and cause death was emphasized by Billings and myself in 1931. The more experience the operator has, the less are wounds overlooked. In the nine cases in which lesions were overlooked the condition was very critical at the time of operation and all were wounds of the upper abdomen. One can appreciate the difficulty of finding wounds of the kidney, pancreas and upper surface of the liver in a patient who has severe abdominal hemorrhage and whose condition is critical. Several of these had failed to show any reaction from shock after the use of the usual antishock measures, and their condition had rapidly changed from bad to worse because of continued bleeding, the operation having been done primarily for the control of hemorrhage. Under such circumstances the amount of the anesthetic and the time required for the operation assume more than the usual importance in the result. It is in such cases that blood transfusions will be of the greatest value. We have available in the blood bank at the Pennsylvania Hospital this morning 3,000 cc. of blood and 10,000 cc. of plasma. We prefer to give blood or plasma on the operating table. It is our policy to explore the entire intestinal tract from the stomach to the rectum and to do it carefully and, if possible, inspect all organs and examine carefully for retroperitoneal hemorrhage. X-ray examination before operation in gunshot cases is a useless procedure. Our low mortality is due in a great measure to early operation and the liberal use of the blood bank for transfusions of plasma and blood.

DR. WALTER E. LEE, Philadelphia: The mortality from gunshot wounds of the abdomen in civil life has not been greatly reduced during the last twenty-five years. The unusual number of cases which Dr. Rippy reports does not make me envious, but I must confess surprise. His mortality of 61.9 per cent in gunshot wounds of the abdomen with visceral injury we match at the Graduate Hospital in Philadelphia with 53.2 per cent, slightly higher than Dr. Walkling's of 50 per cent, but it would seem that an average mortality of 50 per cent could be accepted in the United States at the present time. I agree with Dr. Rippy that the time interval between the receipt of the injury and the operation is the most important factor in influencing the end result. The better results which have apparently been obtained at the Pennsylvania and Graduate hospitals I feel are largely due to the emergency transportation service. Second in importance is the rapidity with which the operation is performed. The operating room is at all times prepared for such emergencies, and within thirty minutes after the request is made, night or day, the operating room will be ready to function. Next in importance is the availability and use of the blood bank for transfusions of whole blood and plasma, in the accident wards and the operating rooms. Last, but probably not least, in both of these hospitals for the last ten years residents in surgery, or fellows, have been in charge of the accident ward service, supplemented by staff assistants who make it possible at all times to operate within thirty minutes, if necessary. In my experience a patient who has not reached the operating room within two hours after the injury falls into the class of delayed operation. In our group there was only one patient who recovered when operated on four hours after the receipt of the wound. I agree with Dr. Rippy that, next to the time interval, hemorrhage is the most important factor in determining mortality.

DR. THOMAS M. JOYCE, Portland, Ore.: There are two important points which Dr. Rippy brought out, one of which has been brought out many times in the past, but no amount of repetition can overemphasize its relation to low mortality rates, and that is early blood transfusion. That the high mortality in gunshot wounds of the abdomen is directly proportionate to this factor has been understood for many years, but unfortunately, owing to the catastrophic suddenness of these cases and often to their economic status, it is impossible to procure blood when necessary. It is for this reason that the institution of blood banks in our larger hospitals and in many military medical units is to be highly praised. The other important point is the fact that mortality rates vary inversely to the length of time of the operation. I feel that this is merely another measure of the skill and care on the part of the surgeon. A hurried operation, a hurried, incomplete search and a hurried closure all leave opportunities for overlooking damage. The point is also brought out by Dr. Rippy's figures that there is a certain limit to which a patient can be subjected to a surgical procedure under anesthesia. It is after the second hour that the mortality again begins to rise. Dr. Rippy's paper brings out the importance of careful surgery, skilfully performed in the early stages, with proper attention to secondary factors of shock and hemorrhage.

DR. R. ARNOLD GRISWOLD, Louisville, Ky.: Penetrating wounds of the abdomen are one of the greatest problems in our large Southern city hospitals. Dr. Rippy's paper is an excellent summary of his experience in Nashville and there is nothing in it with which I disagree. When these patients come into the hospital they can be roughly divided into three groups: (1) the group with obvious penetration of the peritoneal cavity and perforation of or trauma to an intraperitoneal viscus, (2) the group with obviously no penetration and no intraperitoneal damage and (3) a group in which it is not at first evident whether or not there is visceral injury. In the

first group, most of the patients die of hemorrhage. That is not according to the experience of those who saw such patients in base hospitals during the war. Rapid, early operation is essential and, as Dr. Rippy says, the appearance of shock in these people is not primary shock, it is due to hemorrhage and there is no excuse for delaying operation in order to treat shock. Once the abdomen is opened, stopping the hemorrhage is the first consideration and closing the perforation is the second consideration. Perforation of large vessels must be dealt with rapidly. These are a few details of operation that I have seen neglected. One of the most frequent gun shot wounds is that of the kidney or kidney pedicle. This is best handled by reflecting the colon medially, just as one would free it for a resection, and doing anterior nephrectomy rather than turning the patient over. Another is a wound of the stomach on the posterior surface. One should not hesitate about splitting the anterior surface wide open instead of trying to get around to the back of the stomach. There is, however, a second group of cases in which there is penetration and perforation of a viscus that we do not operate on. Those are patients who have shot gun wounds with bird shot, and ice-pick wounds of the abdomen. Shot gun wounds at close range are such large wounds, tearing so many large vessels, with so much visceral damage, that repair of them is inadequate; it just doesn't work. In the patient who is shot by bird shot at far range, even though there is penetration of a hollow viscus, these wounds seal themselves much better than the surgeon can seal them by any operative measure. That also applies to wounds caused by the ice-pick, which is one of our most common Southern weapons. In cases which I feel do not immediately fall into one of these classes one has to wait to determine the exact status. Waiting too long in a penetrating wound of the abdomen is disastrous. Therefore within the last year in these borderline cases, which run from 10 to 20 per cent, I have used peritoneoscopy.

DR. LEO ELOESSER, San Francisco: Under optimal conditions in the best hospitals, with the best surgeons, the mortality of abdominal gun shot wounds is still appalling. The same holds true in military hospitals. I think that the reason is to be sought not in the promptitude with which the patients have come to operation but in the nature of the injury itself. Dumont of the Belgian Volunteers and Jolly of the Australian Volunteers in Spain, both with extensive experience in the treatment of abdominal war injuries, have stated that the fate of the abdominal injury is determined not so much by what is done as by the missile itself. In other words, if a man is wounded through the lower part of the abdomen, if besides a wound of the colon his large vessels are severed and he has a mesenteric tear with much hemorrhage, that man is going to die no matter whether one operates on him in a few minutes or in a few hours. If, on the other hand, a man is operated on who has, say, nothing but an injury to the liver, with some bleeding, he will probably live whether he is operated on early or late or whether he is not operated on at all. This has some bearing, I think, on the results of treatment not only in peacetime but much more so in wartime, because of the corollary that it is unwise to establish hospitals undertaking definitive treatment so close to the front as has been done in the past, with a view to treating abdominal injuries early. If the front line hospitals are established a little farther back we shall save many more patients by treating fractures efficiently than by attempting to treat abdominal injuries early. One other point: I think we may be a little too loath in these injuries to do enterostomies or colostomies or to extraperitonealize by packing off a conglomerate of intestinal coils badly damaged by a missile. If this was done more often, perhaps a few men might be saved who otherwise would be lost.

DR. ELKIN L. RIPPY, Nashville, Tenn.: In the Nashville General Hospital the mortality in the last three years has been lowered to around 51 per cent. This lowering of the mortality has been accomplished by the application of these principles: elimination of unnecessary handling, repeated transfusions, early exploration and the administration of sulfanilamide. Since preparedness is the keynote of America at the present time, let us as surgeons contribute our part by a thorough study of injuries as a result of gun shot fire.

HEAD INJURIES

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We are primarily concerned here with the management of patients with head injury admitted to the neurosurgical service at the Cook County Hospital. This service was formally established on Oct. 1, 1938. The present report is concerned with the patients admitted during 1939 (table 1).

In any statistical consideration of a series of patients the type of material and the criteria employed in the selection of cases are of importance. Our patients are admitted directly to the neurosurgical ward from the examining room of the hospital. They are persons who obviously have a head injury because of the external signs of trauma and patients who give a history of head injury followed by a period of unconsciousness.

A sizable group of patients have received a head injury but have no signs of cerebral damage. Another group are grossly intoxicated and, at the time they are seen in the examining room, it is impossible to tell whether or not they have a brain injury. These two groups are admitted for observation, and of course many of them later prove to have more or less serious cerebral damage. Others do not and are dismissed after a brief period (from one to three days) of observation and x-ray examination of the skull.

TABLE 1.—*Results in 1,394 Cases of Head Injury Admitted to Cook County Hospital During 1939*

Results	No. of Cases	Per Cent of Total
Recovered	1,111	79.7
Disabled	91	6.5
Dead	192	13.8
Within 6 hours after admission	45	3.3
Over 6 hours after admission	147	10.5

In contrast to these we have a large group of elderly, ill nourished and debilitated patients in whom there is a high mortality from preexisting disease or from disease complicating their head injury. There were 479 patients (34.4 per cent of the total) in this series past the age of 50 (table 2). It will also be noted from table 2 that there were a large group of cases of unknown severely injured derelicts of whom we were unable to determine the age. There were 123 (8.8 per cent of the total) patients in this group with a mortality of more than 40 per cent. A large group of our patients are chronic alcoholic addicts. In this connection it is interesting to note that 545 patients (39.8 per cent) had the odor of alcohol on their breath at the time of admission.

These patients are all cared for in the services of the first two authors and are admitted in rotation to these services from the examining room of the hospital. We have pooled our statistics for the purpose of this report, and while there is no essential difference between the statistics for the two services it must be emphasized that

From the neurosurgical service of the Cook County Hospital and the Coroner's Laboratory of Cook County.

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the two services are conducted in the same ward and by the same nursing, intern and resident personnel but under the independent and individual supervision of the two authors mentioned. We have made no attempt to standardize our methods of treatment; we have made every attempt to make a statistical check against each other where there are differences in treatment.

Ideally, when a patient with a head injury first comes under observation an estimate should be made of the amount and extent of cerebral damage. Obviously, in many cases this cannot be done because of lack of adequate history, inability to carry out complete examination of the patient (because of shock and so on) and inability to correlate physical signs and symptoms with the organic brain injury present. From a practical standpoint some classification is essential and since 1934 we have used a purely clinical grouping. Our individual terminology has varied, but the grouping is the same: A, moribund patients, B, gravely injured persons, C, mildly injured persons and D, complicated cases. A fifth group of cases with late sequelae might be added, but obviously this is not of importance in the early management, except from the standpoint of prophylaxis. One of us (Verbrugghen) recently collaborated with

TABLE 2.—*Distribution of Cases by Decades*

Decades	Total Cases	Recovered	Dead	Mortality Rate Per Cent
10-19.....	53	51	2	3.8
20-29.....	178	165	13	7.3
30-39.....	279	257	22	7.9
40-49.....	282	254	28	9.9
50-59.....	266	231	35	13.2
60-69.....	153	127	26	17.0
70-79.....	46	36	10	21.7
80-89.....	14	10	4	28.6
Unknown....	123	71	52	42.3
Total.....	1,394	1,202	192	13.8

the late Dr. Fantus in an outline of the therapy of head injury [1] that discusses the treatment appropriate to each of these groups.

In this article the treamtent of head injuries is discussed from the following standpoints: (1) symptomatic, (2) control of intracranial pressure, (3) treatment of complications, both surgical and nonsurgical, and (4) the prophylaxis and treatment of late sequelae.

SYMPTOMATIC

First and foremost is the treatment of the collapse (shock) which is so prominent in the cases of group A (moribund) and of considerable importance in group B (grave injury). These patients should have the head lowered, especially those who are stuporous or comatose and are vomiting or have considerable mucus in the upper respiratory passages. They should be on their side or face to prevent aspiration of mucus or vomitus into the lungs. After vomiting has ceased and the patient has regained consciousness or at least regained his pharyngeal and laryngeal reflexes, he may be left flat in bed. Most conscious patients (adults) seem to prefer being flat with perhaps one pillow, and we believe that the preference of the patient may well be followed in this respect.

External heat is of great value in the early care of these patients. It is applied in our service in the form of a large "heat cradle," the source of heat being lighted electric bulbs. In cases of severe collapse, the patient is immediately placed in one of these without any attempts to remove his street clothing or to give him a bath. This is important, as well meaning nurses or attendants frequently add measurably to the patient's state of shock by unduly exposing him in their effort to remove his clothing, bathe him and otherwise "make him presentable." Obviously, if a patient is in shock the removal of his clothes and dirt, or even vermin, from his body should be postponed until his general condition has improved. One caution must be mentioned in connection with the use of external heat. Patients with brain injury, especially children, often have disturbance of the thermoregulatory mechanism. The rectal temperature should be taken hourly (every half hour in children), and as soon as it is over 100 F. the application of external heat should be discontinued. Other forms of heat, such as electric pads or hot water bottles, are equally efficacious. Some require greater caution to prevent burns of an unconscious patient.

Administration of fluid intravenously is often not only necessary but life saving to these patients. Obviously, large quantities of isotonic fluids should not be given to patients many of whom in a few hours will be liable to an increasing cerebral edema. Recent work (Coller and Maddock,[2] and White, Sweet and Hurwitt [3]) has shown the lack of necessity for administering sodium chloride unless there is abnormal loss of it, which is rare in these cases. Excessive chloride probably will promote development of edema in injured tissue. For this reason we prefer to administer dextrose dissolved in distilled water. A 10 per cent solution is mildly hypertonic and will at once increase fluid volume and reduce tissue edema. In our experience 1,000 cc. is an ample amount to give in most cases.

Stimulants are of value to the patient in marked collapse. Caffeine, nikethamide, strychnine or even powerful constrictors such as epinephrine or neosynephrin are used as indicated. Too rapid an elevation of blood pressure during the first few hours is to be guarded against, although doubtless its danger has been overemphasized.

Next to the immediate treatment of the shock or collapse, quiet is of the greatest importance in the management of a case of head injury. Manipulation of the patient is restricted to the minimum required for necessary examination and essential nursing care. X-ray examination is to be postponed until the patient is both out of danger and is conscious and cooperative. Attempts to obtain x-ray films earlier only endanger the life of the patient and usually end in failure because of lack of cooperation. The only exceptions to this rule are occasional special cases such as compound depressed fractures or suspected meningeal hemorrhage, and even here they are often better dispensed with. Until the patient has recovered from his initial collapse, surgical procedures including the suture of lacerations, reduction of other fractures or lumbar puncture must be postponed.

Sedatives are necessary in many cases and imperative in some. A wide choice is available. Morphine is always contraindicated at least in the early stages. We consider paraldehyde the most valuable single sedative

1. Fantus, Bernard, and Verbrugghen, Adrien: The Therapy of the Cook County Hospital: Head Injuries, J. A. M. A. **114:** 243-245 (Jan. 20) 1940.

2. Coller, F. A., and Maddock, W. G.: Water and Electrolyte Balance, Surg., Gynec. & Obst. **70:** 340-354 (Feb., No. 2A) 1940.

3. White, J. C.; Sweet, W. H., and Hurwitt, E. S.: Water Balance in Neurosurgical Patients, Ann. Surg. **107:** 438-457 (March) 1938.

in the great majority of cases. There is a wide margin of safety in its use and it is rapidly excreted, so that it will not mask developing stupor or coma longer than a few hours. For the latter reason it has to be repeated every few hours if the restlessness or delirium persists. It may be given by mouth or rectum and repeated as necessary.

Mechanical restraints are necessary as a precaution for all patients not constantly attended or perfectly conscious, rational and cooperative. They are not to be considered as a substitute for sedation, as the patient who is allowed to thresh restlessly in his restraints is harming himself by this activity as much as any other. In many cases they are a poor substitute for the constant presence of a nurse or attendant, and often they infuriate an otherwise tractable patient. They are a necessity when constant attendance is impossible for economic reasons; otherwise many embarrassing or serious accidents will occur.

The nursing care of patients with head injury, particularly those in coma, is of great importance. The care of the skin is as important here as with any other bedridden patient and may be made difficult by coma, incontinence and debility. The bladder and bowel also require special attention. The latter usually receives it because of the importance of catharsis or enemas in reduction of cerebral edema. The bladder may be neglected. Voris and Landes [4] have shown by cystometric studies that most patients with acute brain injury have bladders which empty reflexly with from 150 to 200 cc. of filling. However, in contrast to this, others have an atonic bladder with no contractions with from 500 to 600 cc. of filling. One of us (Kearns) has pointed out that relatively slight obstruction of the urethra, such as mild prostatic hypertrophy or urethral stricture in the male or cystocele or rectocele in the female, may prevent reflex emptying of the bladder of comatose or stuporous patients. Palpation or percussion of the bladder alone is not sufficient to determine whether or not there is retention; the catheter must be used. Cystometry, if available, will give exact information on the neuromuscular status of the bladder. Constant drainage with an indwelling catheter or the use of "tidal drainage" (Munro [5]) is necessary if there is any urinary retention; it is often advisable in cases of reflex emptying of the bladder to prevent the frequent soiling of the bed and consequent maceration of the patient's skin.

Drainage of cerebrospinal fluid from the nose or ears is positive clinical proof of a basal skull fracture. Drainage of blood is suggestive, especially if from the ears. In the case of either, no effort should be made to obstruct it. The only exception to this is the occasional profuse nasal hemorrhage which may require a pack to control. This should not be left in longer than a few hours. Any irrigation or mechanical cleansing of the ear or nose is to be avoided. In the case of drainage from the nose, the patient if conscious is to be cautioned against sneezing or blowing his nose. A pad of cotton or gauze may be taped loosely against the ear or nose to collect draining fluid and removed as often as necessary. The patient should be kept flat until the drainage stops.

4. Voris, H. C., and Landes, H. E.: Cystometric Studies in Cases of Neurologic Disease, Arch. Neurol. & Psychiat. **44**: 118-139 (July) 1940.

5. Munro, Donald: Craniocerebral Injuries: Their Diagnosis and Treatment, New York, Oxford University Press, 1938. Munro, Donald, and Hahn, Joseph: Tidal Drainage of the Urinary Bladder, New England J. Med. **212**: 229-239 (Feb. 7) 1935.

CONTROL OF INTRACRANIAL PRESSURE

Cerebral injury is inevitably associated with at least local edema. It often is associated with marked increase in intracranial pressure. If edema or swelling of the brain is generalized, the cerebrospinal fluid is squeezed out of the subarachnoid spaces and ventricles and the brain presents the appearance of the so-called dry brain of the pathologist. Obviously, in these cases an accurate index of intracranial pressure is difficult to obtain by manometric measurement of ventricular or lumbar fluid pressure, especially the latter.

There are three methods available for the control of intracranial pressure following acute brain injury. The first of these is control of the fluid intake. The surgeon must order the amount and type of fluids that a patient is to receive, and the nurses and house staff must see that he does receive it. Obviously, it is necessary that nurses keep an accurate record of the patient's intake. A record of output is of great value but often difficult to obtain accurately. We ordinarily limit fluid intake to from 1,200 to 1,500 cc. in twenty-four hours. Conscious patients, of course, take this by mouth. Unconscious patients or stuporous patients must receive fluids by other routes. The intravenous method is usually employed. As previously stated, we do not give saline solution unless positively indicated but prefer 5 or 10 per cent dextrose solution in distilled water. Patients who are comatose more than three days should have nasal feedings of a high caloric and high vitamin liquid diet. Nasal feedings also provide for administration of drugs or cathartics.

Dehydration of a patient may be actively accomplished, when indicated, by saline cathartics, saline enemas or the intravenous administration of hypertonic solutions. The first two are so well known as hardly to need comment, but it might be remarked that the rectal administration by the drip method of from 200 to 400 cc. of a 50 per cent solution of magnesium sulfate will often be as efficient in the reduction of increased intracranial pressure as the administration of 100 cc. of 50 per cent sucrose intravenously and will be a great deal less drastic from the standpoint of effect on the circulatory system.

The intravenous administration of hypertonic fluids is of great value in many cases of brain injury and is disappointing in orders. Obviously this method requires an intact local circulation in order for it to work and of course the local circulation is more or less impaired at the site of cerebral contusion or laceration. From 500 to 1,000 cc. of 10 per cent dextrose or from 200 to 400 cc. of 25 per cent sucrose or from 50 to 100 cc. of 50 per cent sucrose are the concentrations and amounts most frequently used. Fifty per cent sucrose is very strongly hypertonic and is to be used with corresponding caution.

Drainage of cerebrospinal fluid by spinal or ventricular tap is a method of treatment concerning which there has been a great deal of dispute. Again it is a method of great value in certain cases, disappointing in others and at times positively dangerous. The danger would seem to be principally that of producing a herniation of the cerebellar tonsils into the foramen magnum or of the hippocampal gyrus into the incisura tentorii because of marked increase in intracranial pressure and relatively low cerebrospinal fluid volume. Ventricular drainage, which is of such great value in certain cases of intracranial tumor, has had little trial in cases of

brain injury. It certainly deserves further trial. Cisternal puncture will always be contraindicated where lumbar puncture is in cases of head injury. If there is danger of herniation at the foramen magnum, cisternal puncture is dangerous if not impossible because of the obliteration of the posterior cistern by the prolapsed cerebellum.

TABLE 3.—*Results of Treatment by Cerebrospinal Fluid Drainage and Hypertonic Fluids*

Treatment	Living	Dead	Total	Mortality Rate
Cerebrospinal fluid drainage alone..	37	8	45	17.8
Hypertonic fluids alone	145	86	231	37.2
Cerebrospinal fluid drainage and hypertonic fluid	67	35	102	34.4

Our attitude toward these methods can be best shown by the fact that of 1,394 patients only 231 were treated with intravenous administration of hypertonic solutions, with a mortality for the group of 37.2 per cent. Forty-five were treated with lumbar drainages (receiving at least two) with a mortality of 17.8 per cent. Another group of 102 patients received both forms of treatment with a mortality of 34.4 per cent (table 3). The mortality rate in these groups is not a fair criterion of the efficacy of the two methods, for these were selected cases and spinal drainage was not used on many of the desperately injured patients who did receive intravenous hypertonic solutions.

TREATMENT OF COMPLICATIONS

The treatment of complicated cases naturally resolves itself into the treatment of surgical and nonsurgical complications. In our present series of cases only a relatively small group (2.3 per cent) have been treated surgically. Table 4 presents a synopsis of this group. The mortality was high (50 per cent) and the postmortem observations indicate that this is due to two factors, associated cerebral injury and pulmonary complications, the two often occurring in the same patient. One of us [6] has recently published the results of operation in a series of subdural hematomas. In that series, as in the present one, the mortality was very high in the acute subdural hematomas, owing to the associated brain injury.

The indications for operative treatment may be briefly listed as (*a*) compound depressed skull fracture, (*b*) certain simple depressed fractures and (*c*) extracerebral hematomas. Patients with compound depressed skull fractures are to be operated on with débridement and primary suture within the first eight to ten hours if the condition of the patient permits. Otherwise the wounds are to be left open or loosely approximated and allowed to heal by secondary intention. The fracture then may be elevated as an elective procedure if this is indicated. Unfortunately, if the wound becomes infected in the presence of comminuted fragments of bone an osteomyelitis will usually result, and often meningitis or brain abscess.

The elevation of a simple depressed fracture is almost always an elective procedure and should be delayed until the patient is out of danger. Rarely it may produce local neurologic symptoms or more rarely increased intracranial pressure and require early elevation. Many depressed fractures cause no symptoms and may be left alone. It is our practice to elevate those in the frontal region for cosmetic reasons and those near the motor area because of the frequency of post-traumatic epilepsy associated with depressed fracture.

Extracerebral hematoma, especially extradural, is of course an indication for operative intervention. We have already called attention to the futility of operating on the acute subdural hematoma, although occasionally a patient is benefited. It appears that subdural bleeding sufficient to produce a hematoma large enough to cause pressure symptoms is almost invariably associated with severe brain contusion or laceration. Chronic subdural hematoma develops slowly with a gradual onset of symptoms. Associated brain injury is usually slight and the patient has ample time to recover from it before evidence of his hematoma appears. The operative results are correspondingly good.

The diagnosis of an extradural hematoma in a typical (so called) case should be easy. This is due to the fact that there is no severe associated brain injury and therefore the classic "lucid interval" is present. Then too there is an uncomplicated development of localizing signs. Unfortunately, the "typical" cases are in the minority as associated brain injury of considerable severity is often present. Thus patients are stuporous or comatose from the onset and localizing neurologic signs due to brain injury may be present from the onset. Then too the development of localizing signs may be masked in whole or part by preexisting coma. Careful watch must be kept on all comatose or stuporous patients for the deepening of coma and the appearance of new localizing signs or of signs of increasing intracranial pressure. Since acute brain injury can and does often simulate the picture of a progressive lesion, an exploratory burr hole under local anesthesia must often be resorted to. Six (18.8 per cent) of our thirty-two patients who were operated on had no extracerebral hematoma but they did have brain contusion or laceration. One patient had a subcortical hematoma which was not found at operation. In the seventy-four necropsies performed, extradural hematoma was considered the principal cause of death by one of us (Kearns) in eight cases (10.8 per cent). Two of these patients had been operated on (table 5), leaving six (8.1 per cent) unrecognized cases. This illustrates the frequency and difficulty of recognition of the atypical case.

TABLE 4.—*Patients Operated On*

Conditions Found	Total	Living	Dead	Necropsies	Cerebral Laceration	Pulmonary Disease
Extradural hematoma..	3	1	2	2	2	0
Subdural hematoma.....	17	8	9	5	5	3
Acute.....	7	1	6	4	4	2
Chronic.....	10	7	3	1	1	1
Depressed skull fracture.	6	5	1	0	0	0
Cerebral contusion or laceration.....	6	2	4	2	1	1
Total.....	32	16	16	9	8	4

We do not consider decompression to be of therapeutic value per se in cases of brain injury. First of all, no matter how skilfully performed it can only add to the trauma and edema already present. Secondly, it has been our observation in performing routine decompressions in cases of inoperable brain tumors that it requires several days to a week before adjustment of the intra-

6. Voris, H. C.: Diagnosis and Treatment of Subdural Hematomas, Proc. Inst. Med. Chicago **13:** 129-130, 1940.

cranial contents to the decompression takes place and signs of clinical relief as cessation of headache and vomiting and recession of papilledema appear. Obviously, a therapeutic procedure offering such tardy relief will be of little value in the treatment of acute brain injury.

The most important nonsurgical complications that we have to deal with are meningitis, toxic psychosis, pneumonia and cardiovascular and renal disease.

The incidence of meningitis in this group was low: seven cases (0.5 per cent) with four deaths. This is of interest in conjunction with the fact that there were forty-one cases in the series with drainage of cerebrospinal fluid to the exterior from either nose, ears or a compound depressed skull fracture. In this connection it might also be noted that there were 703 cases of scalp laceration in the series; only nineteen (2.7 per cent) became infected. A number of these had been sutured elsewhere before admission to the Cook County Hospital. The new methods of chemotherapy have in our hands, as in others, greatly reduced both the incidence and the mortality of intracranial infection. There were no cases of brain abscess in this series.

Many of our patients are chronic alcoholic addicts. We have already referred to the large number of patients who had the odor of alcohol on their breath at the time of admission. Further, many of these patients were debilitated and chronically malnourished. As a consequence, the incidence of toxic psychosis was high. This condition when associated with head injury is exacerbated by dehydration of the patient. It is essential to push fluids on these patients and to give ample sedation. At times some sedatives, especially the barbiturates, have a toxic effect and may add to the confusion and delirium. When the vital centers (cardiovascular and respiratory) seem intact we may make an exception to our usual rule and use morphine as a sedative. It is also our impression that spinal drainages, especially when the fluid intake is kept high, are of value in treating these cases. Needless to say, they are performed only with the patients under ample sedation.

TABLE 5.—*Necropsies Performed in Seventy-Four Cases (38.5 per Cent of Total Deaths)*

Necropsy	Number	Per Cent
Extradural hematoma	8	10.8
Subdural hematoma	19	25.7
Cerebral laceration	26	35.1
Miscellaneous associated injuries or diseases	21	28.4
Without skull fracure	29	39.2
With skull fracture	45	60.8

The incidence of pneumonia and cardiovascular, renal and other associated disease was high. Of seventy-four necropsies one of us (Kearns) considered the principal cause of death to be unrelated to the head injury in twenty-one cases, or 28.4 per cent (table 5).

PROPHYLAXIS AND TREATMENT OF SEQUELAE

Sequelae of course cannot be adequately considered in our present series. We hope at a later date to present from the records of our follow-up clinic a complete study of the late effects of the head injury in this group of patients. We would, however, call attention to the fact that ninety-one patients (6.5 per cent) suffered some degree of permanent loss of neurologic function. Another point worth emphasing is the relative rarity of cases seen in the follow-up clinic with subjective post-traumatic symptoms. Most of our patients have no hope of financial compensation as a result of their injury. We do have patients with persistent headache, dizziness, easy fatigue or personality change but they are relatively rare compared with the number seen in private practice. We do not believe we can assume that our treatment is entirely responsible for this. It is our practice to insist on a minimum of two weeks of bed rest for all patients unconscious more than fifteen minutes, all patients who have bloody spinal fluid and all patients with roentgenographic or clinical evidence of fracture of the skull. In addition, patients with mild injury that complain of persistent headache or dizziness for more than three or four days after the injury are placed on a more strict regimen of fluid limitation with fluids limited to 1,000 cc. in twenty-four hours and daily saline catharsis. This seems to be of real value in preventing post-traumatic sequelae in this type of case. To be effective it must be carried out early after the injury. Cases seen later with the post-traumatic syndrome rarely respond to this management.

TABLE 6.—*Mode of Injury*

	Number	Per Cent
Automobile	346	24.8
Assault	346	24.8
Fall	347	24.9
Miscellaneous	56	4.0
Unknown	299	21.5
Total	1,394	100.0

During 1939 there were 1,394 patients with head injury admitted to the neurosurgic service of the Cook County Hospital. Table 1 gives the results. The disabled group includes only those patients who left the hospital with a neurologic defect that was expected to be permanent. Table 2 shows the distribution of cases by decades with mortality rates. This table shows strikingly the importance of the age of the patient in determining his chances for recovery. Many other authors have commented on this.

Necropsies were performed by one of us (Kearns) in seventy-four cases, or 38.5 per cent of the deaths. Table 5 gives what was considered to be the principal cause of death in these cases. It has already been noted that in twenty-one cases (28.4 per cent) of the necropsies the principal cause of death was miscellaneous associated injury or disease. In a large group of cases (25.7 per cent) there were subdural hematomas. These were practically all of the so-called acute type. We have already called attention to the high operative mortality in acute subdural hematomas and to our belief that only the occasional case of this group should be treated surgically.

TABLE 7.—*Seven Hundred and Ninety Patients with Associated Injuries*

Face	528
Extremities	321
Chest	132
Neck	33
Abdomen and pelvis	26
Spine	19
Spinal cord	3
Peripheral nerves	1

The mode of injury is of considerable interest in dealing with cases of head injury. Table 6 shows that our patients can be divided into four almost equal

groups, one injured by automobile accidents, another by some form of assault, another by falls and a fourth by miscellaneous or unknown causes. The high percentage injured by falls speaks for a high percentage of alcoholism and syncopal attacks; the high percentage injured by unknown causes includes a large group of critically injured persons who were picked up by the police and brought in without any history.

Seven hundred and ninety patients suffered associated injuries to other parts of the body, often multiple and most frequently the face, extremities and chest. Table 7 gives the detailed figures for the location of these injuries.

COMMENT

1. In this group of patients, age seemed a very important factor in determining survival.

2. Associated injury and disease are important factors in determining survival. This is especially true in the older age groups.

3. There was a comparatively low percentage of cases in which surgical operation was performed. In this group of cases acute subdural hematoma proved to have a high surgical mortality, and we believe that operation should be done only in the rare case of this group. Chronic subdural hematoma is a much more favorable lesion from the surgical standpoint and operation is always indicated in these cases.

4. Watchful conservatism gives the best results in the management of head injuries. Supportive treatment, enforcement of rest and careful nursing care and observation pay high dividends.

5. Special methods of reduction of intracranial pressure are of value in selected cases. Their routine use is to be condemned.

6. Approximately 40 per cent of patients dying of head injury have no demonstrable skull fracture at necropsy. This shows the absurdity of relying on the presence or absence of fracture of the skull in determining prognosis or treatment.

31 North State Street.

ABSTRACT OF DISCUSSION

DR. S. BERNARD WORTIS, New York: Drs. Voris, Verbrugghen and Kearns have emphasized the problems of the complications and management of head injury. Our material of 1,000 cases at Bellevue Hospital (Wortis, S. B., and Kennedy, Foster: *Surg., Gynec. & Obst.* **55**:365 [Sept.] 1932) is in agreement with their observations. One can only emphasize again the points which they brought out: 1. The mortality rate varies with age. In our group we found that children under 12 had a mortality rate about one-half that of adults over 60. 2. We found that in this city automobile accidents and falls were the commonest causes of head injury. 3. Roentgenograms gave positive evidence of skull fracture in only about half of the patients, so that one cannot depend alone on the skull x-ray examination for determining the degree of severity of any head injury. 4. Autopsies were performed on 380 of our patients, and of these we found skull fractures present in 97 per cent; we found gross brain laceration present in 92 per cent of our autopsy material, and a very low incidence of sepsis; suppurative meningitis in only fourteen cases, and brain abscess in only two cases. 5. Seventy per cent of the people with head injuries admitted to Bellevue Hospital had bleeding from the cranial orifices. 6. Eighty-five per cent of the patients showed clinical evidence of neurologic disturbance of brain function. Ten per cent showed papilledema, 10 per cent had peripheral facial palsy, and generalized convulsions were found in about 110 of the 1,000 patients. We performed skull operations on thirty-seven patients, and in this group the mortality rate was about 50 per cent, so that our treatment has become, as the years go on, more and more conservative. One can only emphasize the fact that the more conservatively one treats these head injuries the more effective the results will be. I agree entirely with the authors' suggestion that no one method of treatment seems to be effective; one must vary one's treatment depending on the clinical observations. Some patients require hypertonic solutions for the reduction of intracranial pressure; other cases do not. Any simple single formula meant to apply to the treatment of all cases of head injury is a detrimental formula.

DR. DONALD MUNRO, Boston: This subject is important because, as one's experience increases with head injuries, it becomes apparent that some day it is going to be the duty of the general surgeon to care for the majority of them, leaving only the difficult ones to the specialists. This paper emphasizes the number of head injuries that occur and covers the first two years following the establishment of the authors' service. My experience has also been in a municipal hospital, but it covers ten years, so perhaps I may be allowed to comment adversely on some of the more important points. I should like to comment on the 38 per cent of autopsies that the authors have had. I have been so fortunate as to have had four out of five, or slightly more, of my head injury autopsies done for me by the medical examiner of Suffolk County. From those autopsies I have learned more about how to handle and diagnose these cases than from any other single factor. In their summary the authors do not classify compound fractures separately. My experience has been that there are a considerable number of compound fractures in any group of head injuries and that their presence materially influences the ultimate mortality and that therefore their segregation is imperative. I am interested in the small number of extradural and subdural hematomas that they have had. I have had about 2,000 cases in the ten years as compared with their 1,300 in one year. In those 2,000 cases I had over forty-four extradural hematomas, as proved by either operation or autopsy. In that same group I had about 300 subdural hematomas. I do not think that there is any reason to differentiate between the acute and the chronic subdural hematomas. After all, every chronic hematoma is acute at its start. Since the chronic stage necessarily carries a lower mortality such a division gives false figures relative to the efficacy of any therapy, I feel strongly that subdural hematomas should be operated on early, and I always feel bad when the medical examiner finds in one of my cases a subdural hematoma that I have not had a chance to treat. In the first 225 of the 300 subdural hematomas that I experienced my operative mortality was 34 per cent. The most important point of difference between myself and the authors has to do with diagnosis. I don't believe that we shall ever get anywhere in learning about this subject until we base our classification of these cases on some universally recognized diagnosis.

DR. JOHN P. STUMP, New York: This paper makes the point that the report of the authors is based on cases of injury not only to the cranium and its contents but also to the rest of the body. Injuries to parts other than the head are important. Many reports have come from services that got their patients late or received patients with head injuries only. At Gouverneur Hospital in New York the patients with head injuries are admitted to the fracture and orthopedic service. They are seen almost simultaneously by a member of the fracture and orthopedic staff and a neurosurgeon. The neurosurgeons are not regarded as consultants, nor are we; we both participate in the treatment of these patients. We have recently reviewed the cause of death of patients having proved cranial or intracranial injuries, and of these approximately 20 per cent died of their head injuries alone, while 30 per cent of the patients who died had mortal body injuries and very slight intracranial injuries. The point I make is the importance of considering injury to the rest of the body, as well as to the head, as a potential cause of death.

DR. HAROLD C. VORIS, Chicago: I too wish we had more necropsies. We are thankful for the ones that we do have, which we owe to the cooperation of Dr. Kearns, the coroner's physician. The absence of skull fracture in from 35 to 40 per cent

of patients dying from head injury is based not only on this series but also on a much larger series collected by Dr. Kearns during previous years in the coroner's laboratory. It is therefore surprising that Dr. Wortis could demonstrate skull fractures in 97 per cent of necropsies in his series. In classification of cases, one can of course by proper selection make a mortality rate as high or as low within certain limits as wished. Therefore, in this preliminary paper we have reported our first year's experience, not with any particular type of head injury, but with the management of all cases of head injury admitted to a large neurosurgical service. I must defend the clinical classification of cases at the time of admission. I agree with Dr. Munro that in the end we must attempt to classify the patient according to the brain injury which we could or thought we could demonstrate. We have already pointed out that to begin with that is often not possible. If one attempts it one often has to change one's opinion within a short time. So from the standpoint of treatment and of early management the clinical grouping mentioned is most satisfactory. I wish we could report the results in acute subdural hematoma that Dr. Munro has. Frankly, our experience with acute subdural hematoma has not been sufficiently good to warrant our continuing to operate on these patients. I agree that there is no need to differentiate the cases preoperatively from extradural hematomas, and, whenever the latter is suspected, exploration should be made. On the other hand, although acute subdural hematomas represent the first stage of a possible chronic subdural hematoma, it is important to differentiate them clinically. The acute subdural hematoma is a large collection of blood without neomembranes, practically always associated with acute brain injury and with a high mortality. The chronic subdural hematoma was originally small and has neomembranes, the patient has recovered from his brain injury and the mortality is correspondingly low.

NEUROGENIC FACTORS IN THE PRODUCTION OF ACUTE GASTRIC ULCER

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AND
HELENA E. RIGGS, M.D.
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Study of fifteen cases of acute gastric ulceration associated with primary intracerebral disease shows no essential pathologic difference between these lesions and the acute gastric ulcer found in the absence of such disease. That the mucosal lesion is the result of an acute phase of gastric circulatory deficiency of a prolonged type is suggested by the presence of chronic degenerative changes in the deeper layers of the stomach wall. Moreover, similar degenerative changes dependent on chronic stasis in the circulatory beds found in other viscera in these cases demonstrate that the so-called "neurogenic" ulcer is not a primary, isolated phenomenon but a focal manifestation of subclinical generalized circulatory insufficiency.

The absence of organic cardiovascular disease in this series, with a mean age of 34 years, permits the assumption that the generalized peripheral circulatory disturbances noted in the viscera mentioned are primarily related to an intracerebral condition. The nature of the pathologic alterations in the viscera suggests that the stasis in the peripheral circulation develops from prolonged vasoconstriction due to stimulation of the cerebral vegetative centers by the primary intracranial disease. Assumption of a relationship between the peripheral circulatory abnormalities, the gastric lesion and central vegetative stimulation is based not only on the demonstrated pathologic alterations in the viscera

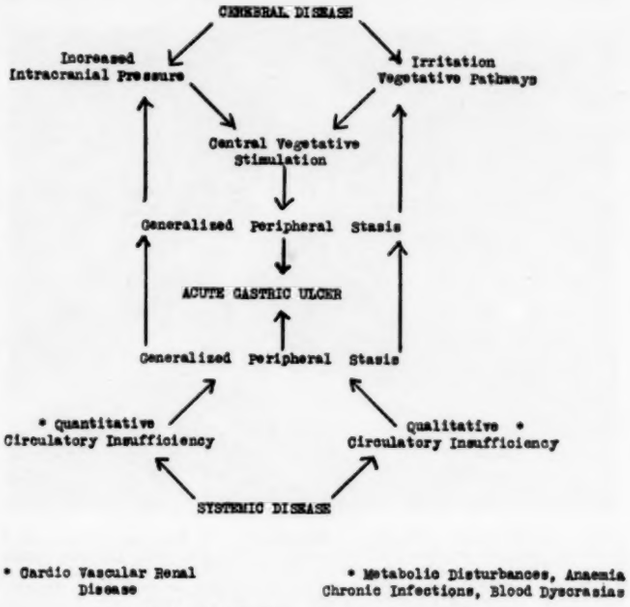

Fig. 1.—Mechanism of acute gastric ulcer.

mentioned but on the location and nature of the cerebral lesion (table 1).

In the cases we are presenting, stimulation of the central vegetative nuclei resulted either from increased intracranial pressure from tumor or abscess within the cranial cavity, or from irritation due to a focal lesion of the central vegetative pathways.

Destruction of the central vegetative nuclei was not an etiologic factor in these "neurogenic" ulcers. In ten cases of expanding new growths associated with acute ulcer it is believed that the ulcer was the direct result of stimulation of the hypothalamic centers from increased intracranial pressure rather than destruction of the centers by the cerebral lesion itself. This is well illustrated by the four cases of tumor involving the

Fig. 2.—Systemic circulatory disturbances in primary intracerebral disease: Section of stomach of a person, aged 29, with primary brain tumor. Focal area of acute ischemic necrosis involving entire depth of mucosa. Chronic stasis in deeper layers with resulting fibrosis and atrophy. Trichrome stain.[1] Reduced from a photomicrograph with a magnification of 57 diameters.

hypothalamic centers. Here the centers were affected by compression of the blood supply rather than by actual invasion of the tissue. On the other hand, the five cases not associated with increased intracranial

From the Divisions of Medicine and Neuropathology, Philadelphia General Hospital.

Read before the Section on Gastro-Enterology and Proctology at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

1. Beyer, E. M.: Trichrome Stain for Astrocytes, Am. J. Clin. Path. **10**: 65-68 (May) 1940.

pressure, while involving the vegetative areas, were essentially characterized by lesions which would result in irritation rather than destruction.

Thus, in this series of "neurogenic" ulcers it is possible to demonstrate a central etiologic factor, namely

Fig. 3.—Systemic circulatory disturbances in primary intracerebral disease: Section of heart of a person, aged 29, with primary brain tumor. Venous channels are greatly dilated. There is interstitial edema. There is increased perivascular connective tissue around both arteries and veins. (Section taken from the apex of left ventricle.) Trichrome stain.[1] Reduced from a photomicrograph with a magnification of 71 diameters.

stimulation of the central vegetative mechanism, which in turn causes the stasis or vasoconstriction responsible for the ulcer. While emphasis has been placed on the role of changes in the peripheral circulation due to stimulation of the sympathetic system in the production of ulcer, we appreciate that parasympathetic stimulation must be considered because of similar demonstrable pathologic alterations in this system.

While the intracranial lesion is the immediate factor initiating cerebral vegetative activity, the stimulating

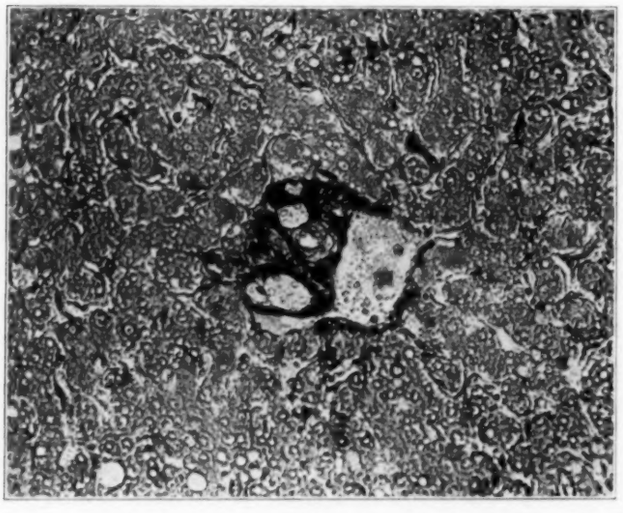

Fig. 4.—Systemic circulatory disturbances in primary intracerebral disease: Section of liver of a person, aged 29, with primary brain tumor. Increased interstitial connective tissue. Dilatation of liver sinusoids. Degenerative changes in liver cells with accumulation of lipoid. Trichrome stain.[1] Reduced from a photomicrograph with a magnification of 230 diameters.

effects of the resulting peripheral circulatory disturbances on the vegetative system itself may establish a vicious cycle. Normally, peripheral vasoconstriction due to central vegetative control insures adequate cerebral blood supply; however, excessive stimulation of this physiologic mechanism may result in anoxia of tissues and later in increased capillary permeability, tissue edema and decreased circulating blood volume. Tissue edema, thus established, augments the irritability of the cerebral centers through the mechanism of asphyxia and, because of its demyelinizing effects on peripheral nerve pathways, may render the entire vegetative system sensitive to subminimal stimuli. In turn, the vasoconstriction of vessels resulting from abnormal neural irritability aggravates the preexisting stasis.

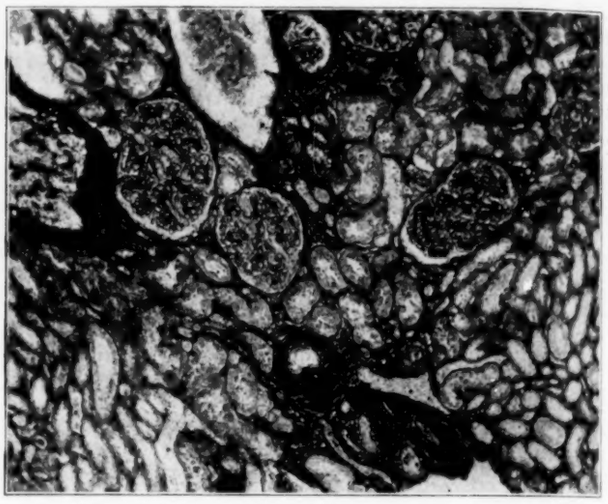

Fig. 5.—Systemic circulatory disturbances in primary intracerebral disease: Section of kidney of a person, aged 29, with primary brain tumor. There is marked increase of perivascular connective tissue. There is thickening of Bowman's capsule and hyalinization of the glomerular capillary tufts. Trichrome stain.[1] Reduced from a photomicrograph with a magnification of 92 diameters.

TABLE 1.—*Acute Gastric Ulceration in Primary Cerebral Lesions in Fifteen Cases*

Location	Cerebral Lesion	Cerebral Vegetative Involvement: Increased Intracranial Pressure	Cerebral Vegetative Involvement: Focal Lesion Vegetative Pathways
Hippocampus	Glioma	+	+
Basal ganglions	Glioma	+	+
Pituitary	Adenoma	+	+
Infundibulum	Adamantinoma	+	+
Parietal	Glioma	+	0
Parietal	Glioma	+	0
Parietal	Meningioma	+	0
Temporal	Abscess	+	0
Temporal	Glioma	+	0
Cerebellum	Abscess	+	0
Periventricular gray matter	Multiple sclerosis	0	+
Periventricular gray matter	Multiple sclerosis	0	+
Periventricular gray matter	Traumatic encephalopathy	0	+
Hypothalamus; basal ganglions	Paresis	0	+
Hypothalamus; basal ganglions	Paresis	0	+

On this premise the basic mechanisms underlying acute gastric ulcer associated with intracranial disease, and ulcer unassociated with such disease, differ only in the nature of the primary factor responsible for the circulatory insufficiency. In "neurogenic" ulcer the pressor effect of central vegetative stimulation by the intracranial lesion initiates the peripheral stasis; in other forms of acute focal gastric lesion the same end result is produced by quantitative or qualitative alterations in the general circulation.

Although it is possible to distinguish neurogenic and visceral factors initiating the peripheral circulatory imbalance which we believe underlies acute gastric ulceration, the blood stasis resulting from such imbalance by its effect on the nervous system establishes a secondary neural cause for all such lesions regardless of the primary etiologic factor. In some cases in which the gastric lesion is not associated with intracranial disease, the influence of this neural factor alone may be sufficient to produce acute gastric ulceration. Generally speaking, however, central vegetative stimulation appears to be the predominant factor in the production of acute gastric ulceration whether it is of the nonneurogenic or the neurogenic type. In "neurogenic" ulcer the factors responsible for such central stimulation (namely increased intracranial pressure or lesions of the vegetative pathways) are due to the primary intracerebral disease (table 2); in ulcers unassociated with intracerebral disease, these same stimulating factors are established by deficiencies in the cerebral circulation resulting from the generalized circulatory insufficiency accompanying systemic disease.

TABLE 2.—*Acute Gastric Ulcer: Etiology of Central Vegetative Stimulation in Primary Systemic Disease*

Increased intracranial pressure		67 cases
Massive cerebral vascular lesion	29	
Brain edema	36	
Lead encephalopathy	2	
Focal lesions, central vegetative pathways		26 cases
Periventricular gray matter	9	
Hypothalamus	2	
Thalamus	4	
Midbrain	2	
Medulla	4	
Spinal cord	5	

TABLE 3.—*Relation of Central Vegetative Stimulation to Acute Ulcer in Primary Systemic Disease, 143 Cases*

Cerebral Complications	Cases	Ulcer	
Increased intracranial pressure	78	67	82%
Focal lesion, central vegetative pathways	31	26	
No cerebral complications	34	20	18%

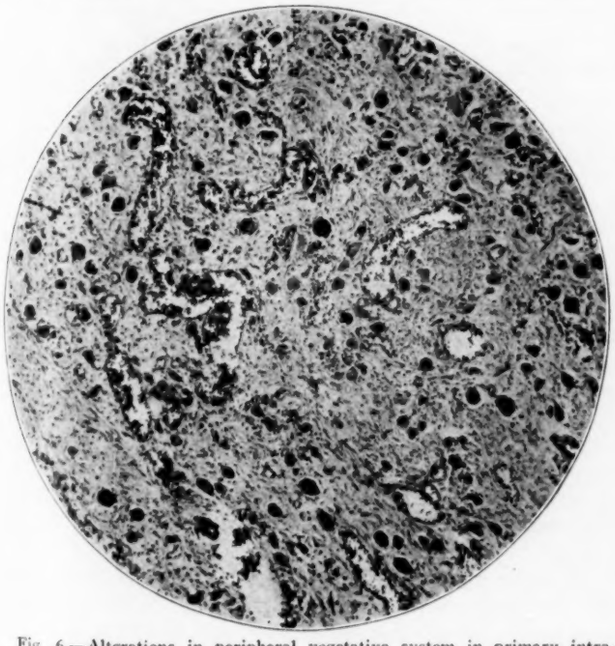

Fig. 6.—Alterations in peripheral vegetative system in primary intracerebral disease. Section of lumbar sympathetic ganglion (vertebral chain) of a person, aged 27, with primary brain tumor. Intense stasis. Loss of ganglion cells. Remaining cells show ischemic degeneration. Marked increase in interstitial tissue. Trichrome stain.[1] Reduced from a photomicrograph with a magnification of 69 diameters.

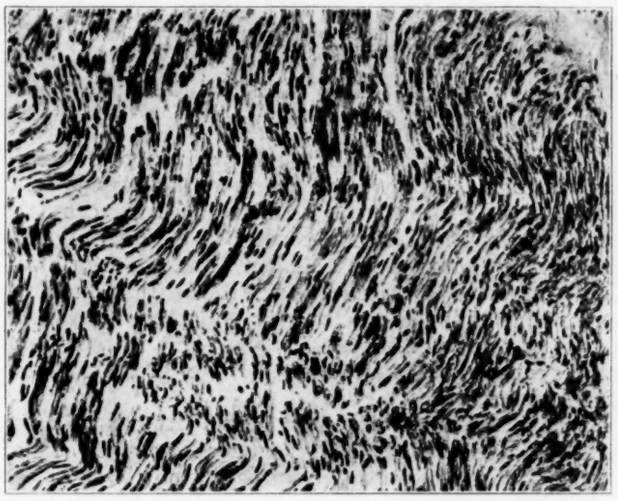

Fig. 7.—Alterations in peripheral vegetative system in primary intracerebral disease: Section of vagus nerve (intrathoracic portion) of a person, aged 27, with primary brain tumor. Nerve fibers separated by edema. Patchy demyelinization with generalized increase in interstitial elements. The remaining myelin sheaths are swollen and vacuolated. Weil myelin sheath stain. Reduced from a photomicrograph with a magnification of 149 diameters.

The influence of central vegetative stimulation in bringing about circulatory insufficiency in systemic disease, thereby precipitating acute gastric ulcer, is demonstrated in table 3. In systemic disease, 82 per cent of the cases with ulcer presented evidence of increased intracranial pressure or changes in the central vegetative pathways which were secondary to the cerebral effects of peripheral circulatory insufficiency. Furthermore, ulceration occurred four times more frequently in cases of primary systemic disease with secondary central vegetative stimulation than in those without such stimulation of the central nervous system.

CONCLUSIONS

1. "Neurogenic" ulcer is a focal expression of subclinical generalized circulatory insufficiency, initiated through stimulation of the central vegetative mechanism by primary intracerebral disease.

2. In the absence of primary intracerebral disease, changes in the vegetative nervous system resulting from circulatory insufficiency may exert a neurogenic influence in ulcer production.

Functional Murmurs.—Potain made the most exhaustive study of functional murmurs. He found such murmurs present in one eighth of all the patients seen in his hospital service. They were present in practically all of the cases of Graves' disease, in 50 per cent of the cases of chlorosis, 25 per cent in measles and scarlet fever, 10 per cent in pulmonary disease. . . . The student should not gain the impression that functional murmurs are truly "accidental" and to be altogether disregarded. Often they may, quite often they may not, be disregarded. A relative insufficiency of the mitral valve due to an enlarged left ventricle produces a systolic murmur which is functional so far as there is no organic pathological process on the mitral leaflets. Such a murmur, however, may be of as great as or greater importance than the systolic organic murmur of an almost perfectly functioning mitral valve.—Major, Ralph H.: Physical Diagnosis, Philadelphia, W. B. Saunders Company, 1940.

FATAL HEMORRHAGE FROM PEPTIC ULCER

ONE HUNDRED AND SIXTEEN CASES COLLECTED FROM VITAL STATISTICS OF SEATTLE DURING THE YEARS 1935-1939 INCLUSIVE

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AND
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The mortality risk of hemorrhage from peptic ulcer has been reported by various observers [1] as varying from a fraction of 1 per cent to as high as 74 per cent, the last figure reported by Chiesman [2] in a selected group of recurring hemorrhages. Allen [3] and Blackford and Cole [4] reported simultaneously (1937) that in older persons having massive exsanguinating hemorrhage the mortality rate approximated 30 per cent in their hospital practice and that age was the greatest factor influencing mortality.

Recent reports of mortality rates of from 1 to 2 per cent for hemorrhage from peptic ulcer when under special medical treatments have been made by Meulengracht,[5] Andreson [6] and others; and Hurst [7] feels that a death in private practice from hemorrhage from ulcer is rare. On the other hand, Hinton,[8] Goldman,[9] Crohn [10] and many others report higher mortality rates, often much higher.

The wide variation in mortality statistics must be due to a difference in the type of cases included for study by the various authors. Most reports include all cases admitted to the hospital for gross hemorrhage, regardless of age or the seriousness of the hemorrhage. Some medical men have excluded surgical deaths from their statistics. Many reports include patients bleeding from marginal ulceration. No report includes the mortality outside of hospitals.

Last year Blackford and Cole [4] reported all deaths during two years considered due to hemorrhage from peptic ulcer, as recorded by the Seattle Bureau of Vital Statistics, together with their clinical experiences with hemorrhage from peptic ulcer. Gross hemorrhage from ulcer was defined as that evidenced by hematemesis or melena without regard to clinical symptoms, and massive hemorrhage as gross hemorrhage with great loss of blood plus critical symptoms of acute anemia. It was noted that early blood determination gave little or no information that was of value. Only 40 per cent of all first hemorrhages in the series occurred in patients past 45 years of age. Half of the hemorrhages in older patients were massive hemorrhages.

From the Mason Clinic.
Read before the Section on Gastro-Enterology and Proctology at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

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2. Chiesman, W. E.: Lancet **2**: 722-723 (Oct. 1) 1932.
3. Allen, A. W.: Surgery **2**: 713-731 (Nov.) 1937.
4. Blackford, J. M., and Cole, W. S.: Am. J. Digest. Dis. & Nutrition **6**: 637-641 (Nov.) 1939.
5. Meulengracht, E.: Brit. M. J. **2**: 320-324 (Aug. 12) 1939.
6. Andreson, A. F. R.: Am. J. Digest. Dis. & Nutrition **6**: 641-646 (Nov.) 1939.
7. Hurst, A. F.: Guy's Hosp. Rep. **86**: 129 (March) 1936.
8. Hinton, J. W.: Am. J. Surg. **33**: 180-182 (Aug.) 1936.
9. Goldman, Leon: Gross Hemorrhage from Peptic Ulcer, J. A. M. A. **107**: 1537-1542 (Nov. 7) 1936.
10. Crohn, B. B., and Lerner, H. H.: Am. J. Digest. Dis. & Nutrition **6**: 15-22 (March) 1939.

VITAL STATISTICS

We now present all deaths recorded with the Seattle Bureau of Vital Statistics during the five years 1935-1939 inclusive in which it seems reasonably certain that the patient died as the result of hemorrhage from peptic ulcer. Death due to hemorrhage from peptic ulcer is so startling an event that the physician should not fail to note the hemorrhage on the death certificate; for this reason, the list should be fairly complete.

These cases have been collected as follows: All death certificates (23,955) were reviewed individually, and each certificate on which the fatality was attributed to hemorrhage from peptic ulcer was listed for study. The cross index of vital statistics was not relied on because of the chance of clerical error; and some errors were found for the two years previously reported.[4] All cases were traced back to hospital records, to the physician who signed the certificate or to the family of the deceased. One coroner's case could not be traced.

The list includes all cases in which death was apparently properly attributed to hemorrhage from peptic ulcer. The tracing back to clinical records allowed the elimination of a few cases which we felt should not be included, particularly (1) bleeding from gastrojejunal or marginal ulceration, (2) sudden fatal gastric hemorrhage which was the only evidence of ulcer, (3) acute hemorrhagic gastritis and (4) gastric hemorrhage which was manifestly not the immediate cause of death.

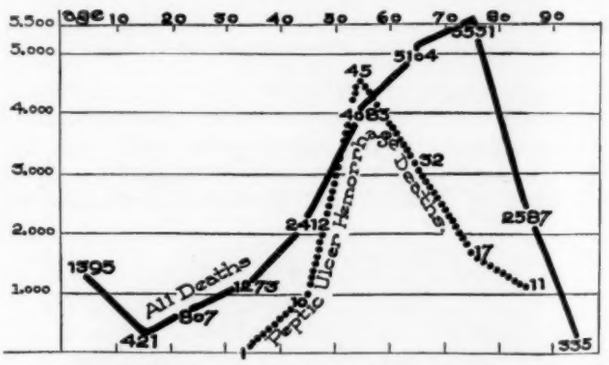

Chart 1.—Distribution of 116 deaths from peptic ulcer hemorrhage among 23,964 deaths.

The records of ninety-seven men and nineteen women, or 116 cases in all, have been thus collected as representing all deaths in Seattle during five years which were considered due to hemorrhage from peptic ulcer. Exactly half of these, fifty-eight, were confirmed by autopsy as death due to hemorrhage from ulcer. The high percentage of autopsies is due to the fact that most deaths reported were in hospitals with active postmortem services and with competent pathologists in charge.

Autopsy records of these fifty-eight cases show that the hemorrhage was from gastric ulcer in thirty-seven and duodenal ulcer in seventeen, and that the location of the ulcer was not stated in four. Arteriosclerosis was recorded repeatedly on the death certificate as a contributing cause of death, as determined by autopsy.

Deaths attributed to hemorrhage from peptic ulcer but not studied by autopsy are, of course, not proved to be deaths due to hemorrhage from peptic ulcer. These cases were, however, so certified by the physician in charge. It is usually considered that approximately 90 per cent of gross gastric hemorrhages are hemorrhages from peptic ulcer. If we assume that only

80 per cent of clinical diagnoses not studied by autopsy are correct and that all the diagnoses confirmed by autopsy are correct, then the diagnosis of death due to hemorrhage from peptic ulcer should be correct in more than 90 per cent of these 116 cases.

Chart 1 shows by decades the total number of deaths in Seattle during five years and a superimposed curve shows the total number of deaths from hemorrhage from peptic ulcer during these years. It is evident that the great majority of deaths occurred between the ages of 50 and 70 years. Only three individuals were under 45. Their ages were recorded as 39, 42 and 43.

Chart 2 shows where these patients died: 22 per cent of them (twenty-six cases with eleven autopsies) at home—a group of fatalities never included previously in any clinical statistics on this subject; fifteen of the twenty-six patients dying at home were past 70 years of age. Sixty per cent of hospital mortality occurred in private general hospitals; and the private general hospitals in Seattle carry 66 per cent of the general hospital occupancy.[11]

Almost all fatalities (97+ per cent) occurred in patients past 45 years of age, and less than 3 per cent were of persons under 45 years.

Most dramatic is the fact that 78 per cent of all fatalities (ninety cases) occurred following the first hemorrhage; only 22 per cent of all patients dying of hemorrhage from peptic ulcer (twenty-six cases) gave a history of previous hemorrhage.

Twelve patients who died had been operated on for emergency control of bleeding. One was operated on within forty-eight hours of the onset of hemorrhage and died of peritonitis on the tenth day; eleven were operated on from three to eleven days after the onset of massive hemorrhage.

Emergency operation on older patients in the first forty-eight hours of critical bleeding has rarely been undertaken in this country. We have found no report of a series of such cases. Later operation (after forty-eight hours) in critical cases has been followed by very high mortality rates.

Emergency operations in Seattle for hemorrhage from peptic ulcer are unusual. This is evidenced by the fact that not more than one surgical fatality has occurred during five years in any private hospital in Seattle and that two of the private hospitals have had no postoperative deaths. At the King County Hospital, six fatalities have followed the work of six different operators. No Seattle surgeon has had more than one death. Yet the city of Seattle has averaged two deaths each month from hemorrhage from peptic ulcer, and two thirds of those patients who died were under 70 years of age and were admitted to hospitals.

CLINICAL IMPRESSIONS

The clinical study of last year emphasized that, although 60 per cent of first hemorrhages from peptic ulcer occur in patients under 45 years of age, fatalities from hemorrhage are almost unknown in patients aged less than 45 years. The present study of the total mortality experience with hemorrhage from peptic ulcer taken from the vital statistics of a city of nearly 400,000 people shows how true that statement is.

The risk to life of hemorrhage from ulcer in younger patients is manifestly a small fraction of 1 per cent and the risk does not exceed 1 per cent even if only massive exsanguinating hemorrhages are considered. Therefore one is rarely, if ever, justified in attempting to select those younger patients who are likely to die from hemorrhage from ulcer in order to consider operation as necessary to save their lives. No surgical procedure under such circumstances carries a risk of less than 1 per cent.

We have also pointed out that critical massive hemorrhage in older patients carries a mortality rate approximating 30 per cent, confirming Allen's report.[12] We also noted that five of our six fatalities followed the first hemorrhage. Allen [3] reported 60 per cent of fatalities as following the first hemorrhage. It is usually taught that risk to life increases with each succeeding massive hemorrhage; yet three fourths of all fatalities reported in Seattle followed the first hemorrhage. It therefore seems certain that the first massive hemorrhage in older people is by far the most dangerous hemorrhage, a fact quite at variance with clinical impressions.

Surgeons have often remarked that risk to life increases with each recurring hemorrhage from ulcer; they have overlooked the fact that the mortality of all subsequent hemorrhages represents only about one fourth of the total mortality from bleeding ulcer. Three fourths of all deaths occur following the first hemorrhage; only one fourth of all patients dying from ulcer hemorrhage have lived through a first hemorrhage to die later from another hemorrhage.

HOSPITALS	age 40	45	50	60	70	75	80
37 County	1		2	13	12	2	4 3
15 Swedish			1	7	3	2	1 1
8 Providence		1	1	• 5	• 1		
10 Marine		1	1	• 4	4		
5 Seattle General			1	2	2		
5 Columbus				• 4	1		
3 Virginia Mason			1	1	1		
2 Maynard				1	• 1		
5 Others				1	• 4		
26 Home			1	7	3	3	5 7
116 Total	1	2	8	45	32	7	10 11

• = operated

Chart 2.—Deaths from peptic ulcer hemorrhage.

Such is the challenge of vital statistics for a reduction in the mortality of older patients. Bleeding from the ruptured, spurting, arteriosclerotic artery is apparently uncontrollable in one third of the cases of massive hemorrhage from ulcer in older people, unless it can be controlled by surgical intervention.

Occasionally, death from exsanguination occurs so quickly that there is no chance for any kind of intervention. Some patients are seen so late that operation is a last resort, and usually a forlorn hope, for life saving. Some patients are so handicapped by age or other infirmities that any surgical procedure is hardly to be considered. Still, the majority of these 116 patients whose bleeding resulted fatally were admitted promptly to hospitals and died from exsanguination a number of days later.

SURGICAL INDICATIONS

Finsterer,[13] Gordon-Taylor,[14] Hinton,[8] Pfeiffer [15] and many others believe that prompt operative intervention

11. J. A. M. A. Hospital Reports.

12. Allen, A. W., and Benedict, E. B.: Ann. Surg. **98**: 736-749 (Oct.) 1933.
13. Finsterer, H.: Surg., Gynec. & Obst. **69**: 291-298 (Sept.) 1939.
14. Gordon-Taylor, Gordon: Lancet **2**: 811-815 (Oct. 12) 1935.
15. Pfeiffer, D. B.: Gastric Hemorrhage, J. A. M. A. **111**: 2198-2201 (Dec. 10) 1938.

should save many lives. Their reports give reason to hope that the record for critical hemorrhage in older people may be greatly improved by operation within the first forty-eight hours. After that time there is abundant evidence of terrific mortality following surgical intervention. It seems that tissue changes and bone marrow exhaustion after forty-eight hours of exsanguination make recovery from the shock of operation an unusual event.

Published reports of operative cases to date are, however, inconclusive in that patients operated on have not been grouped according to age. Many such operations have been done on younger patients. From the evidence of our clinical records, together with the evidence of vital statistics, the mortality risk of critical hemorrhage in younger patients is less than 1 per cent; hence operative intervention in such cases should actually increase the risk to life. In fact, we know of no surgical experience that justifies emergency operation for hemorrhage from ulcer in younger patients, even with prostrating hemorrhage. Less than 1 per cent will die if not operated on.

Forty-five years seems to be the age past which the risk of death from hemorrhage increases rapidly. In fact, nearly all fatalities are included in the group of older patients having critical hemorrhages from ulcer, and three fourths die following the first hemorrhage. The mortality rate would be well above 30 per cent in this group if all the massive hemorrhages shown in vital statistics could be included.

Operations done after unsuccessful attempts at supportive treatment through days of bleeding have usually resulted fatally. Eleven of the twelve patients cited as operated on in our vital statistics were operated on from three to eleven days after the onset of massive hemorrhage. Delayed operation at the Massachusetts General Hospital resulted fatally in 100 per cent of the cases.[12] All experience seems to show that operations done after several days of massive bleeding are followed by terrific mortality.

Prompt surgical intervention for critical bleeding from ulcer in older patients seems to offer the only hope of reducing the present mortality rate, which is above 30 per cent. An actual reduction in present surgical mortality should be accomplished by excluding younger patients from operation even when they are suffering critical hemorrhage from ulcer.

SUMMARY

All consecutive fatalities from hemorrhage from peptic ulcer during five years in Seattle show that:

1. Ninety-seven + per cent occurred in patients past 45 years of age.
2. Seventy-eight per cent died following the first hemorrhage.
3. Twenty-two per cent died at home.
4. Sixteen per cent were women.
5. Only twelve patients who died were operated on, each by a different surgeon.
6. Eleven of the twelve were operated on more than forty-eight hours after the beginning of hemorrhage.
7. Autopsy studies show more deaths from hemorrhage from gastric ulcer than from duodenal ulcer.

CONCLUSIONS

The vital statistics of Seattle show a remarkable number of deaths from massive hemorrhage from peptic ulcer in patients past 45 years of age, as contrasted with the very few deaths in those under 45. Three fourths of all deaths resulted from the first hemorrhage. Prompt surgical control of massive hemorrhage seems to be the only hope of saving the lives of one third of the older patients having massive hemorrhage from peptic ulcer. This study gives further confirmation of the great risk of operations done after forty-eight hours of massive bleeding from ulcer.

Virginia Mason Hospital Building.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BOLES AND RIGGS AND DRS. BLACKFORD AND WILLIAMS

DR. WALTER L. PALMER, Chicago: Drs. Boles and Riggs have shown pathologic alterations in the viscera other than the stomach in fifteen cases of acute gastric ulceration associated with primary intracerebral disease. These lesions may be due to circulatory disturbances. It would be interesting to know whether similar changes were found in patients dying of causes other than intracerebral disease and whether the changes were found both with and without gastric ulceration. The possibility that the lesions may be the result of the complex processes of death, of so-called agonal changes, does not seem to me to be excluded by the histologic evidence offered; in fact, acute gastrointestinal ulceration is seen not infrequently both in man and in the experimental animal in death from various causes. Perhaps such ulcerations are due to peripheral circulatory changes occurring in the last hours of life and perhaps the central nervous system does play a role in these circulatory changes. These assumptions, however, seem to be by no means proved; however, even if they are true they do not seem to warrant the further assumption that "the central vegetative mechanism has an important part either as a primary factor or a neurogenic complication in the etiology of acute gastric ulcer." Would it not be more appropriate to reverse the reasoning and to look on the ulcer as an incidental result or a localized manifestation of the complex processes leading to the death of the organism, which in these cases happened to be initiated by intracerebral disease? Drs. Blackford and Williams have approached the subject of massive hemorrhage from a new point of view and obtained results which emphasize still further the importance of this complication of peptic ulcer. I am impressed particularly with the seriousness of the first hemorrhage. Dr. Kirsner and I last year reviewed our cases of massive hemorrhage and found that five of eight deaths occurred in the first hemorrhage. We found that 1.8 per cent of our patients, numbering 165, under 50 years of age died, whereas the mortality rate of patients over 50 years of age was 7.6 per cent. It may be that surgery is indicated in this age group; however, at present, and under the circumstances obtaining in massive hemorrhage, I doubt that the surgical mortality rate will be found to be less than the 7.6 per cent obtained in our series with medical treatment.

DR. SIDNEY LEIBOWITZ, New York: These remarks are based on studies of Dr. Chasnoff and myself and express our combined opinions. We wish to compliment Drs. Blackford and Williams on their unique approach to the problem and their careful analysis of such material. The value of this study is enhanced by the fact that so large a percentage of the cases at autopsy proved to be instances of hemorrhage from ulcer. Our experience is based on studies of clinical material rather than fatalities alone. It has repeatedly been stressed that a large proportion of the fatal cases of ulcer hemorrhage occur in the arteriosclerotic age group. Yet to hear this figure placed at 97 per cent is unusual. In our own small series of ninety-three patients nine deaths occurred, of which five (55 per cent) were of patients older than 45. Equally surprising is the report that 78 per cent of the fatalities occurred after the initial hemorrhage. This finding is contrary to the prevailing impression and will undoubtedly alter our concept of the gravity of initial hemorrhage. We have no doubt that an earnest effort was made to check the possibility of previous hemorrhage, but it is conceivable that some

of these patients may have had previous episodes of bleeding not revealed in their histories. We examined our own cases from this standpoint and were surprised to find that as many as 55 per cent gave no previous history of hemorrhage. Let us accept the statistical conclusions arrived at by the authors. If, in addition, we assume that early operative intervention in the older group is attended by a mortality appreciably less than the 30 per cent apparently obtained with medical treatment in this group, we must inevitably conclude that massive first hemorrhage in older individuals demands immediate surgery. We are reluctant to follow this reasoning to such a conclusion. The patient's age and the fact that it is his first bleeding episode are insufficient indications, in any one case, that death will ensue. The problem still remains to determine early which patients are likely to die. We feel that there are no satisfactory early criteria. By the time the clinical picture indicates the probable fatal outcome, it is usually too late for successful surgery.

DR. IRVING GRAY, Brooklyn: In 1931 Cushing reported that following the injection of solution of posterior pituitary and pilocarpine into the lateral ventricle in man there was increase in gastric tonus, hypermotility and hypersecretion. The following year he reported a series of cases in which there occurred acute perforation of the esophagus, stomach and duodenum responsible for death from one to four days after operation on the brain for the removal of tumors. He presented evidence in support of the existence of a parasympathetic center in the hypothalamus which sends fibers to the medullary vagus center. Beattie, Masten and Bunts, Keller, and Holler and Pollack have made contributions which point to the existence of a parasympathetic center situated in the hypothalamus which sends impulses downward to the medullary vagus centers. Drs. Boles and Riggs have pointed out that the acute gastric ulceration in their series shows (1) no essential pathologic difference between these lesions and the acute gastric ulcer found in the absence of such disease, that (2) the mucosa lesion is the result of an acute phase of gastric circulatory deficiency of a prolonged type and that (3) pathologic alterations in other viscera in these cases demonstrate that the so-called neurogenic ulcer is not a primary isolated phenomenon but a focal manifestation of a generalized circulatory insufficiency. In view of these observations, which indicate that the so-called neurogenic ulcer is not an isolated phenomenon in the stomach but an expression of generalized circulatory insufficiency, it might be reasonably assumed that a variety of cerebral pathologic conditions may lead to the production of focal areas of vascular disturbances. Whether or not alterations in function of the parasympathetic center in the hypothalamus are the cause of focal vascular disturbances in the stomach and elsewhere is an important question. One may ask whether a chronic ulcer of the stomach may not have its original inception through some disturbance of the vegetative centers. Can an acute gastric ulcer follow as a result of emotional disturbances which are usually expressed through the autonomic nervous system? Will continuous imbalance of the two major divisions of the autonomic nervous system cause gastric ulceration of a chronic nature? The psychoanalytic school has repeatedly called attention to the improvement which follows psychotherapy in patients who have gastrointestinal disorders, including peptic ulcers. We have all long recognized the importance of the autonomic nervous system in the treatment of patients with chronic peptic ulcer.

DR. BURRILL B. CROHN, New York: Drs. Blackford and Williams have helped to classify the statistics of hemorrhage. In past years hemorrhage was spoken of without analysis of age incidence, sex or complicating factors and without differentiating mild from severe hemorrhage. A first severe hemorrhage may arise from carcinoma; if a first hemorrhage is fatal, the chances favor carcinoma. Secondary hemorrhages are more likely to be benign and are usually less severe. I have not yet met a surgeon who in this country has operated in a case of ulcer hemorrhage in the first twenty-four hours of a severe hemorrhage. Finsterer has formulated his surgical approach: he employs infiltration anesthesia of the abdominal wall, the patient being operated on within the first twenty-four hours, but there is no clear concept of what exactly should be done. In some cases he uses tamponade against the side of the ulcer, in others he ties off the vessels and in still other cases he resects with exclusion of the duodenum. If one is going to undertake a program of operations for hemorrhage within the first twenty-four hours, one should approach the problem with some sort of understanding of its real significance, risks, mortality and curability.

DR. ANDREW B. RIVERS, Rochester, Minn.: The work of Drs. Blackford and Williams regarding the grave threat to life of massive hemorrhages beyond 45 has borne abundant fruit. They have made all of us more cautious in the handling of these patients. The additional attention lavished on older patients with gastric hemorrhages has saved many lives. I will not quibble about their statistics. I do not quite share their apprehension regarding the danger to life of gross gastric hemorrhage in the younger section of the 45 years and older group, but let's assume that in the older group the proportion of fatalities is about 30 per cent; we are called out to see an old fellow who has just had a massive hemorrhage. The authors have shown us that more often the first hemorrhage is likely to be the fatal one. The diagnosis therefore may be unsettled. The patient may be in shock. His condition is critical. How shall one know whether this patient should be subjected to surgical treatment? Drs. Blackford and Williams believe that the more serious the hemorrhage the more necessary it is to operate on this patient promptly. We have been taught that he has something like a 70 per cent chance of survival if not operated on. If we inveigle a surgeon into a laparotomy, a number of the 70 per cent who would survive otherwise will not then be so fortunate. In my experience it has often been impossible to determine the gravity of the patient's condition for the first twenty-four hours following a gastric hemorrhage. The continuation and recurrence of bleeding or the development of other complications has usually decided the outcome. But granted that our impressions regarding the diagnosis and the extreme gravity of the condition are correct, there is always the probability that such a patient will not survive surgical treatment. Theoretically it sounds simple to clamp a spurting vessel and stop it from bleeding, but actually surgical procedures under such conditions are usually complex and difficult. These deliberations are of vital importance. Our responsibility in these matters is a serious duty. All practitioners of medicine must be made to realize the serious threat to life of a massive hemorrhage in an elderly patient, but do we want them to believe that the treatment of choice under these circumstances is to subject their patients to surgery? If I at 60 was to have a gross stomach hemorrhage and was removed some distance from an expert gastric surgeon, I would rather stake my chance of survival on an ice pack, a hypodermic or two, and a couple of transfusions. Drs. Blackford and Williams have done a fine piece of work by teaching the profession that a gastric hemorrhage in an elderly patient is a complication which requires most careful attention. I believe, however, that conscientiously applied nonsurgical means would ordinarily result in fewer fatalities than would the precipitous employment of operative methods.

DR. HYMAN I. GOLDSTEIN, Camden, N. J.: It is of interest to note with regard to the presentation by Boles and Riggs on "Neurogenic Factors" the publications on the "Hypothalamus" by Haymaker and Anderson (*Internat. Clin.*, June 1940, pp. 226 and 253) and Donald Sheehan ("The Hypothalamus and Gastrointestinal Regulation," 1940). Contributions have been made to our knowledge of such relationship by Schiff (1867), Ebstein (1874), Durante (1916), Brown-Séquard (1876), Pomorski (1892), Keppich (1921), Stahnke (1924), Mogilnitzky (1925), Korsts (1828), Cushing 1932) and others. Frerichs produced ulcer of the stomach in a cat after division of the splanchnic nerves and of the celiac axis. Ebstein, by injuries to the brain and cord in animals, produced ulcers on a hemorrhagic base. Articles by Master and Bunts (1934) and Vonderahe (May 1939) are of interest. William Fabricius Hildanus (1560-1634) knew of the relationship of the brain and gastrointestinal disturbances (Opera Observationum et Curationum, Francofurti, 1646)! Several questions might well be put to the authors. Why do young infants get ulcer even without hyperacidity? Bird's patient had normal gastric secre-

tion. Why are so many people with hyperacidity free from ulcer? Why do ulcers occur so frequently in the duodenum with an essentially alkaline secretion? Why do ulcers continue to heal, even in the presence of hyperacidity? Why the not uncommon occurrence of ulcer following extensive burns or some surgical (abdominal) operation? Why do ulcers apparently heal spontaneously in women during pregnancy? Since Celsus (20 A. D.), Aëtius Amidenus (502-575 A. D.), Avicenna (908-1036), Laurentius Phryesen (Fries, 1518), Rembert Dodonaeus (1517-1580), Felix Plater (1534-1614), Marcellus Donatus (1586), Schenck (1595), Forestus (1594) and Jacopo Penada (1793) discussed ulcer of the stomach and duodenum, we have had the problem, still unsolved, of the etiology of peptic ulcer. Let us hope as the result of such work as reported today that a solution to this problem will be found.

Dr. Anthony Bassler, New York: I want to express my admiration to Drs. Blackford and Williams for their work in helping to elucidate a difficult question. Those who have to do with the hospital service in the city of New York have a real problem in this question. We have about a thousand deaths in New York from hematemesis, and among the hospitals to which I belong we have about eighty in a year. I should like to say that when a patient is brought in in extreme condition our attitude is one of rest and large doses of morphine and watching, and from then if after about six hours we are not satisfied with the clinical condition of the patient, we pass a tube in the stomach and drain it and we can get a better idea whether the bleeding is continuing than by any other method we have tried so far. I know about the high protein method. If right away we come to the idea that there is probably a pyloric obstruction present, for whatever reason, that case should be considered surgical at once, because our experience has been that these patients die if they have a pyloric obstruction; so that when from the twelfth to the forty-eighth hour there is a continuation of bleeding, dripping from the tube, and particularly if it is of a serosanguineous character, we are very prone to consider that case as surgical within the forty-eighth hour and try not to wait until a full four days has passed, because, if these patients are operated on after the full four days after a massive hemorrhage, they almost invariably die.

Dr. Horace W. Soper, St. Louis: In 1931 I reported my method of treatment of massive hemorrhage from the stomach by the introduction of the Levine duodenal gastric catheter, thoroughly lavaging the stomach, breaking up the clot, leaving the catheter in place, and employing siphonage. Ordinarily one will get some mucus and small blood clots which may be seen in the glass connecting tube which leads to the container on the floor. Bright red blood in the tube indicates arterial hemorrhage, which of course calls for immediate surgical procedure. In my experience the surgeon has always been able to locate the spurter, ligate it and save the patient.

Dr. Frederick W. Mulsow, Cedar Rapids, Iowa: I have been making similar studies from death certificates and doctors' records in Cedar Rapids in the last eight years, and during that period we have had sixty-five deaths proved due to peptic ulcer. One difference, apparently, from other records is the number of deaths among women. Of the sixty-five deaths, twenty-three were of women. One other factor, as Drs. Blackford and Williams mentioned, is that death is much more common among older persons. Of those over 50 years of age there were forty-two deaths—about two thirds. Among those over 60 years of age, twelve deaths were due to hemorrhage, eight to perforation and five to obstruction, with surgical operation. Young persons, of course, showed a much higher rate of perforation as the cause of death.

Dr. Russell S. Boles, Philadelphia: Dr. Palmer states that it might be well not to assume that our observations on acute ulceration were directly traceable to the sequence of events we described; that perhaps it would be better to think of the ulcers having occurred incidentally. We cannot agree with Dr. Palmer that the ulcers were incidental for a number of reasons. First I would refer him to the original observations of Cushing, who reported a group of cases in which perforation of acute ulcers occurred following operation for brain tumor. Surely the acute ulcerations and perforations described by Cushing were not merely incidental to his operations. I would refer Dr. Palmer to the original research work of Drs. Klemperer, Penner and Bernheim which they reported last Monday before the American Gastro-Enterological Association. As a result of prolonged administration of epinephrine intraperitoneally they produced acute ulcers of the stomach which obviously were not incidental but the result of the administration of the epinephrine. Ulcers which occur as a result of experimental production of hypoglycemia, which it is known stimulates the hypothalamic centers, cannot be regarded as incidental. The acute ulcers produced by Hoff and Sheehan and others in the rhesus monkey as a result of irritation of the hypothalamic centers would not seem to be incidental. Last year Dr. Necheles reported before the American Gastro-Enterological Association the occurrence of acute ulceration of the stomach following the ligation of certain blood vessels and this would appear to be experimental confirmation again of our observations. Finally, I would refer Dr. Palmer to the investigative work of Nedzel, who by means of experimental pitressin episodes brought about the production of acute hemorrhagic conditions and acute ulceration of the stomach which definitely were not incidental. For these reasons I believe we are justified in assuming that there is a correlation in the pathologic conditions we have reported and that the ulcers we observed were not purely incidental but were dependent for their production on the associated neurogenic conditions. I am going to request permission for Dr. Riggs to answer the one remaining question about the pathologic changes we have described. I should like to emphasize that our conclusions have been based on the study of a large group of cases by an experienced neuropathologist. For the past five years Dr. Riggs has examined sections of the stomach in every case in which the brain has been removed. This constitutes more than 1,500 cases.

Dr. Helena E. Riggs, Philadelphia: Dr. Palmer's suggestion that the changes we have demonstrated in the viscera in our cases are due to the agonal state rather than to chronic circulatory insufficiency is rather disturbing to a pathologist. Since the time of Virchow the pathologist has considered an increase of interstitial connective tissue associated with loss of parenchymatous elements as characteristic of chronic passive congestion, i. e. chronic circulatory insufficiency. The very nature of such tissue alterations precludes the possibility of their occurrence in the last few hours before death. As for the gastric mucosal lesion, we have stated that this is acute and therefore must be considered as occurring in the agonal period. However, we do not believe that the mucosal lesion alone constitutes a gastric ulcer. On the basis of experimental and gastroscopic studies, and of our own postmortem examinations, we feel that an acute ulcer is the result of persistent or recurrent alterations in circulatory efficiency to focal areas of the entire gastric wall. In the deep layers this results in chronic degenerative changes; in the mucosa—which has greater regenerative powers—in cyclic destruction and regeneration. Eventually, as we have attempted to demonstrate in our slides, the mucosa fails to regenerate and the acute phase of gastric ulceration passes into the chronic stage. Dr. Palmer has also suggested that the presence of acute gastric lesions in cases of primary intracerebral disease is merely incidental or, at most, associated with terminal failure of circulation. It will be seen from our charts, however, that such gastric lesions occur in cases of primary cerebral disease with a frequency which is statistically significant. Further, it is our experience that in such cases clinical symptoms of acute gastric ulcer, such as melena or blood stained vomitus, frequently occur. As to the effect of circulatory insufficiency on the vegetative nervous system, we have been able to demonstrate clinical signs of vegetative stimulation, such as pupillary changes, pulmonary edema and rapid pulse, in many of the cases which at postmortem showed acute gastric ulcers based on circulatory insufficiency.

Dr. John M. Blackford, Seattle: With regard to the mortality rate of 30 per cent, I would emphasize that this represents in our series approximately the mortality of the more serious hemorrhages. Serious hemorrhage was noted in approx-

imately half of all who bled in the older group. I think this is very important because when mortality rates are quoted as only 9, 10 and 15 per cent they are based on hospital admissions with gross hemorrhage at all ages, and that is not the basis of our report of a 30 per cent mortality rate. Dr. Allen's work and our own has emphasized that those are critical hemorrhages which present evidence of great loss of blood and shock and all that goes with it. I want to agree with Dr. Rivers, but if I were in a remote part of the world, with no competent surgeon available and I suffered a gastric hemorrhage, I would not be operated on; however it does seem to me that, if this risk of 30 per cent from serious hemorrhage which is agreed on by a number of men besides myself is correct, then probably the surgeon should be able to work out some method of stopping the hemorrhage, because only in that way can these lives be saved.

RECURRENT PEPTIC ULCER

SITUATION OF RECURRENCES AND THE IMPORTANCE OF STUDIES OF PAIN IN THE RECOGNITION OF SUCH RECURRENCES

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Peptic ulcer is among the most frequent of the organic causes of gastronomic unhappiness, and pain is the most consistent among the complaints of patients who have this disease. Not only is the proper evaluation of pain important in the recognition of peptic ulcerative disease, but much regarding the histopathologic condition of such a lesion can be determined by a critical study of the type, situation and reference of the pain present. Although there is a fairly consistent reduplication of characteristics in the symptomatology of peptic ulcer, there is nevertheless considerable variability in the complaints which patients who have this disease will volunteer. This variability seems reasonable when it is considered that, as peptic ulcer invades successive depths of tissue, definite changes in symptomatology may well occur. As neighboring organs are involved and as normal physiologic processes become increasingly disturbed, symptoms might well arise which would substitute for or complicate a syndrome already established by an original, uncomplicated lesion.

PURPOSE OF THE STUDY

Previously, one of us [1] reported a study of pain caused by ulcers situated in different portions of the gastrointestinal tract. In this study the varying states of pathologic development, as ascertained at operation, were correlated with the symptoms of which the patient had complained immediately prior to laparotomy. Thus, by comparing a sufficient number of such accurately allocated lesions with the symptoms they produced, it was believed that a type of serial-section picture could be constructed which might permit correlation between the various changes of the histopathologic life cycle of ulcer and the changing, painful experiences noted by patients who had such a lesion. It was noted that ulcers which penetrated deeply into the tissues produced shifts of the original pain into secondary regions. In such instances much of the symptom complex set in motion by the previously uncomplicated peptic ulcer was lost. By studying with sufficient thoroughness the exact situation of the pain and the course over which it was projected, as well as the behavior of the symptoms caused by lesions in various situations and at varying depths of tissue, it was believed that certain information might become available by means of which the anatomic and physiologic problems of abdominal pain and its pathways of conduction could be better understood. In this paper we hope to extend this information by means of an examination of the more common localizations of secondary ulceration following various surgical procedures, and by a discussion of the pain they produce.

From the Division of Medicine, the Mayo Clinic.

1. Rivers, A. B.: Pain in Benign Ulcers of the Esophagus, Stomach and Small Intestine, J. A. M. A. **104**: 169-174 (Jan. 19) 1935.

PATHWAYS AND MECHANICS OF PAIN

There are three important pathways over which painful impulses originating in peptic ulcer can reach the patient's consciousness:

1. The pathway most commonly used for pain produced in uncomplicated peptic ulcers is probably that which involves the visceral splanchnic nerves. The impulses originate in the wall of the gastrointestinal tract, course along sensory bundles in the sheaths of the splanchnic nerves, cross over through the white rami communicantes of the thoracic nerves and pass along the posterior roots of the spinal nerves, thus reaching the posterior horn of the spinal cord. This type of pain has a quality peculiar to itself. It is usually a rather diffuse type of pain, poorly localized, frequently associated with flatulence and usually not very severe, although at times it may be rather acute and colicky. It is dissipated quickly at times, leaving but little residual soreness and tenderness. Seldom is rigidity of the abdominal muscles associated with such pain, and cutaneous hyperalgia is usually absent. To explain the genesis of pain arising from viscera which ordinarily seem practically insensitive to the stimuli which produce pain on the surface of the body, the presence of an "adequate stimulus" must be postulated. This "adequate stimulus" has been assumed to be an increase in pressure within the gastrointestinal segments which results in stretching of the circulatory fibers of the viscus. We have reason to believe that this mechanism is not so much one of stretching but rather one of "contracting resistance" of the hardy muscular fibers, as marked distention of circular organs which have lost their muscular contractility frequently produced no splanchnic type of pain. It has been suggested that in the stomach this spasm can be the result of hyperacidity, which acts as a trigger mechanism for the production of such spasm. The ordinary uncomplicated syndrome of peptic ulcer with its recurring painful phenomena, dissipated by food and soda, is probably illustrative of this type of pain-producing mechanism, interpreted along the splanchnic pathway.

2. The varying shifts of pain into secondary regions that occur when the ulcer in its progression begins to venture beyond the confines of the bowel can probably be explained more satisfactorily on the assumption of the existence of a second pathway which supplements the originally utilized splanchnic routes. Painful impulses, it will be remembered, may also be conducted from tissues surrounding the wall of the bowel to the spinal cord over the sensitive cerebrospinal nerves, twigs of which supply the parietal peritoneum and mesentery. This route is designated as the spinal-sensory-somatic pathway.

The shifting type of distress caused by a perforating ulcer is a "referred pain." When the ulcer, because of

its progression, makes contact with tissues supplied by spinal-sensory nerves, pain may be interpreted as being felt along the peripheral cutaneous, more highly differentiating, branches of these same nerves, such as the intercostal nerves.

In a series of ulcers studied by one of us [1] it was found that duodenal ulcers with perforating characteristics produced a shift of pain from the original region to the right upper quadrant of the abdomen and right side of the back. Gastric ulcers so complicated produced a shift of pain toward the left upper abdominal quadrant and the left portions of the thorax and back, whereas perforating gastrojejunal ulcers almost always produced definite shifts of pain downward or through to the back. Such shifts of pain all conform fairly well to peripheral regions supplied by somatic branches that could be expected to be invaded by penetration of such lesions.

3. There seems little doubt at the present time that painful impulses originating in the cardiac portion of the stomach may reach the spinal cord over the phrenic nerves. This pathway is probably utilized rarely, except by perforating lesions invading the diaphragm. One of the most conclusive indications of this pathway is demonstrable in the following report:

A man aged 26 entered the Mayo Clinic complaining of indigestion and pain in the tip of the left shoulder which extended into the base of the neck. This pain arose several hours after meals, and was relieved by eating. Ten years previously gastroenterostomy had been performed elsewhere because of perforating gastric ulcer. Roentgenograms revealed a deformity high in the stomach. At operation the patient was found to have what appeared to be a perforating gastric ulcer, which had become adherent to the diaphragm and spleen. Excision of the ulcer was not possible and, as the gastro-enteric stoma was functioning normally, no further surgical procedure was undertaken at that time. The pain in the tip of the shoulder persisted and two weeks following this operation left phrenic emphraxis was performed, a procedure which completely relieved the pain in the shoulder and neck.

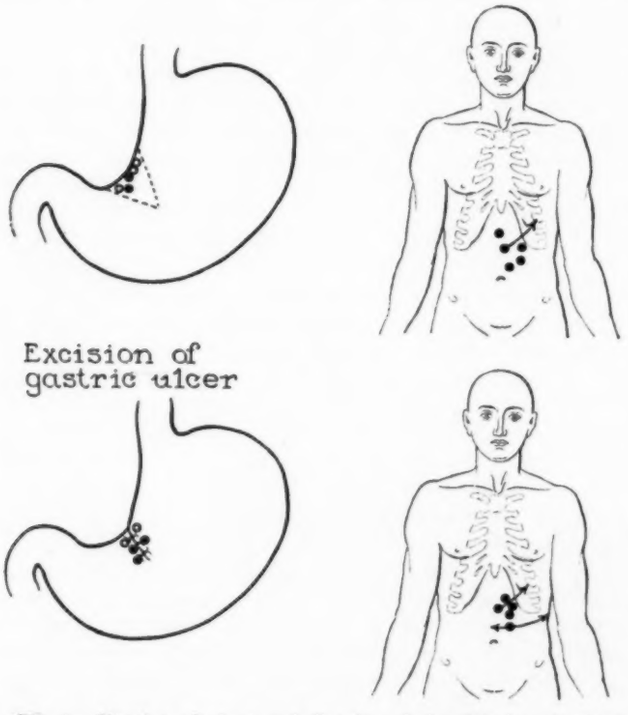

Fig. 1.—Situation of ulcers and direction of the shift in pain therefrom in the case of simple excision.

The phrenic nerve arises mainly from the fourth cervical segment, and to some extent from the third and fifth cervical segments, of the spinal cord. After passing through the thorax it supplies motor fibers to the diaphragm and also supplies sensory fibers to the diaphragmatic pleura as well as to the peritoneum, lining the under surface of the diaphragm. Originating in the same segments of the cord as the phrenic nerve are the suprascapular, supraclavicular and supraacromial nerves, which are involved in the production of pain in the tip of the shoulder. These nerves may thus be regarded morphologically as the superficial cutaneous branches of the phrenic nerve.

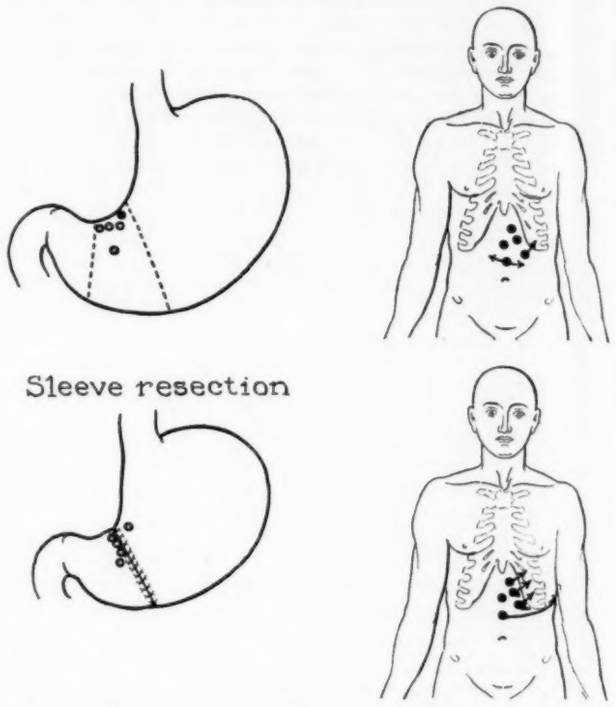

Fig. 2.—Situation of ulcers and direction of the shifts in pain therefrom following sleeve resection.

To explain the mechanism of such referred pain, various theories have been advanced. In discussing this, Mackenzie [2] has the following to offer: "One very attractive explanation is supplied by Ross's [3] theory of an 'irritable focus' in the spinal cord." Applying this theory to pain in the tip of the shoulder, it would be supposed that the painful stimuli passing up the phrenic nerves to the third, fourth and fifth cervical segments of the spinal cord produce an irritable focus in the corresponding portion of the posterior horns of gray matter.

Because of this state of irritation, a lowering of the threshold of the cells of the posterior horn results and the consequence is that the stream of afferent stimuli from the cutaneous nerves entering the same segments, although normally silent and unobserved, now becomes capable of producing pain.

Occasionally, pain in the tip of the shoulder is noted on the right side following perforation of a duodenal

2. Mackenzie, James: Remarks on the Meaning and Mechanism of Visceral Pain as Shown by the Study of Visceral and Other Sympathetic (Autonomic) Reflexes: I. Sympathetic Reflexes, Brit. M. J. **1**: 1449-1454 (June 23), 1906; III. The Mechanism by Which Visceral Pain is Produced, ibid. **1**: 1523-1528 (June 30) 1906.

3. Ross, James: On the Segmental Distribution of Sensory Disorders, Brain **10**: 333-361 (Jan.) 1888.

ulcer, an occurrence which Morley [4] assumes is the result of contact of the irritating fluid with the sensitive under surface of the right portion of the diaphragm. In perforation of a high lying gastric ulcer, pain, if present, is situated usually on the left side.

MATERIAL FOR STUDY

This study includes sixty-five cases of postoperative recurring ulcerations. The exact situation of both primary and secondary lesions was ascertained by roentgenographic evidence. The situation of the secondary ulcerations was confirmed by direct inspection of the tissues at operation. Only those cases were accepted for study which had a history that included exact information regarding the syndrome under consideration.

An inquiry was made as to the situation, duration and character of the pain, the time of its onset and the mode of relief. A special attempt was made to compare the characteristics of the original lesion with those of the one which developed postoperatively. Ten types of operative procedure are included in this group. Each type is illustrated by an illustration (figs. 1 to 10) in which are placed the situations of the primary and secondary ulcerations, together with the situations and extensions of the pain which they produce. Circles indicate lesions of the anterior gastric or intestinal wall and dots indicate ulcers of the posterior wall. Each dot indicates one case and the situation of maximal distress. The arrows indicate the direction of the shifting pain (fig. 1).

Recurring Gastric Ulcer Following Excision.—Occasionally, during surgical procedures undertaken to cure

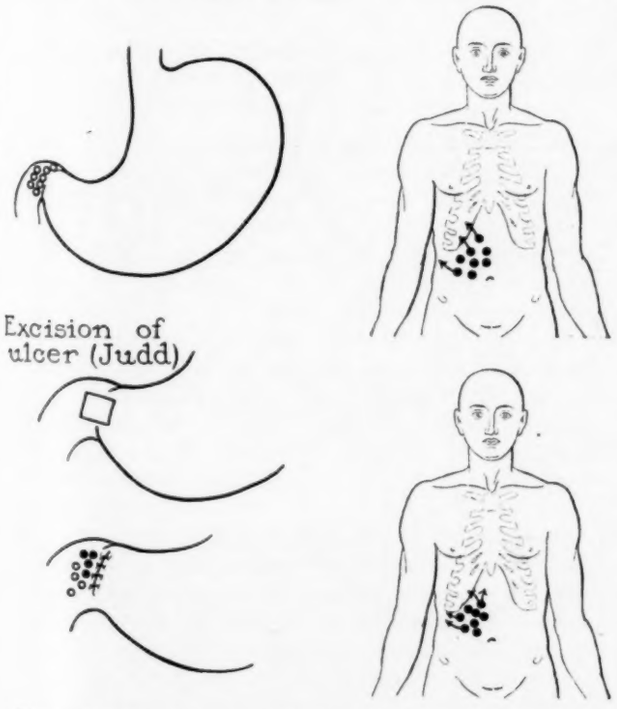

Fig. 3.—Situation of ulcers and direction of the shifts in pain following performance of the Judd type of excision and pyloroplasty.

a gastric ulcer, it is found that the lesion is small and that it will lend itself easily to excision. Unless excision of the ulcer is rather extensive or unless excision with gastro-enterostomy is performed, there is a tendency for such lesions to recur. If this occurs, the resulting ulceration usually develops in immediate contiguity to, and more often on the pyloric side, of the suture line. The diagnosis of recurring ulcer is usually made without difficulty. Even though there is no distinct roentgenographic evidence of a lesion, the history of recurring difficulties with pain localized in the region of preoperative complaint, usually mimicking in almost every detail the original symptoms, is sufficient to make the diagnosis. There is a tendency for these lesions to penetrate, particularly into the pancreas. There is a notorious lack of periodicity in the syndrome of the secondary ulceration, the distress being present almost daily. There is also less tendency to relief by the ingestion of food and alkali (fig. 2).

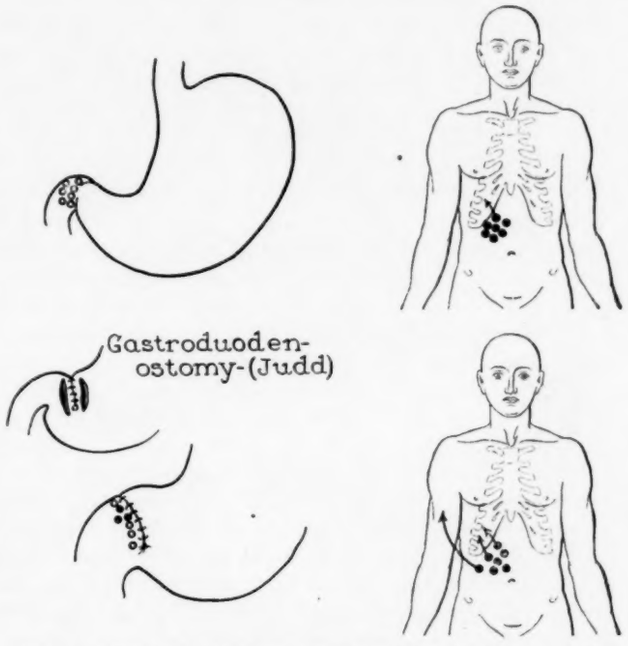

Fig. 4.—Situation of ulcers and direction of the shifts of pain following performance of the Judd type of gastroduodenostomy.

Recurring Ulcer Following Sleeve Resection.—Several years ago it was not uncommon for surgeons to perform resection of a segment of stomach in which a gastric ulcer was situated and then restore the continuity by end-to-end anastomosis. Other surgical procedures are now employed, and they are so much more successful in dealing with gastric ulcers that sleeve resection is now seldom used. It was found that following the sleeve type of procedure mechanical difficulties developed, resulting in disturbed function of the stomach; furthermore, there was a high incidence of recurring ulceration. Additionally, coexisting duodenal ulcers were not infrequently overlooked during such operations, and consequently, postoperative difficulties were very common. The situation of recurring ulceration following sleeve resection was found to be in or immediately below the suture line. Occasionally, recurrence would take place a short distance above the site of anastomosis. The type of pain caused by primary and secondary ulcers was very similar, although in the latter instance the pain was somewhat more severe than that caused by primary ulcers, with a tendency to shift into the left side of the thorax, a circumstance probably referable to the fact that most of the recurring ulcers were of the perforating type. Again, relief afforded by

4. Morley, John: Abdominal Pain, Edinburgh, E. and S. Livingstone, 1931.

ingestion of food and soda was not so complete as it had been before the operation for primary ulcers (fig. 3).

Recurring Ulcer Following the Judd Type of Excision and Pyloroplasty.—Judd pointed out that there are certain cases of duodenal ulcer on the anterior wall

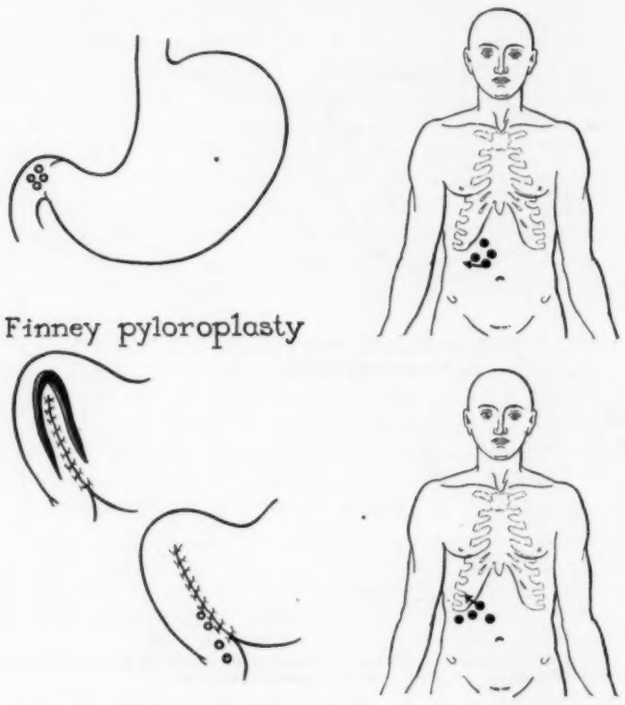

Fig. 5.—Situation of ulcers and direction of the shift in pain following performance of the Finney type of pyloroplasty.

in which excision and reconstruction of the pyloric outlet are followed by excellent results. This operation was most commonly employed for young patients who had nonobstructing ulcer in whom there was marked hyperacidity and a small, high lying, hypertonic stomach. The incidence of recurrence, in this group, was rather high. Such recurrences usually developed in the posterior duodenal wall slightly distal to the incision, although occasional recurrences were found in the anterior wall. Unless careful exploration revealed that there was no coexisting ulcer in the posterior duodenal wall, recurring difficulties might rapidly develop from an overlooked lesion on the posterior wall. The symptom complex of these recurring ulcerations was slightly more severe than that caused by the primary lesion. The situation of the pain was similar, with more tendency to extend into the right side of the thorax or back, as is indicated in figure 3. Relief from the pain afforded by ingestion of food and alkali was less marked.

Recurring Ulcer Following Judd Type of Gastroduodenostomy.—There are certain instances in which anastomosis of the stomach to the uninvolved portion of the duodenum, circumventing the pylorus and the lesion, has been utilized with some success in the treatment of these conditions (fig. 4). The region of the ulcer is avoided and the anastomosis is made entirely in healthy tissue. Although the results of this operation were sometimes good, recurring ulcer not infrequently developed. Such recurrences were found in the duodenum and in many instances were thought to be merely a reactivation of the original ulcer which had failed to heal. The situation of secondary complaints was similar to that of the primary lesion. Again, the pain of the recurring lesion proved to be somewhat more constant and intractable than that of the original ulcer. In most instances there was also some mechanical disturbance resulting in a moderate amount of gastric retention.

Recurring Duodenal Ulcer Following the Finney Type of Pyloroplasty.—In figure 5 is illustrated the type of operation devised by Finney for reconstruction of the pyloric outlet, dealing directly with the ulcer and yet achieving adequate anastomosis between the stomach and the duodenum. In some instances this operation was followed by good results and in others by mechanical difficulties; in still another group recurrences of ulcers took place, usually in the vicinity of the anastomosis or slightly below the suture line. Occasionally a second ulcer was found, lower in the duodenum. The situation and symptoms of recurring ulcer following this type of surgical procedure are usually very similar to those experienced at the time of the original ulcer. The region of distress is close to the costal margin, slightly lower than that caused by acute cholecystic disease. Additionally there are the usual signs of organic disturbance and deficiency in gastric emptying, which probably contribute to the inadequacy of relief achieved by the ingestion of food and soda as compared to relief achieved by the same measures directed against the primary lesion.

Recurring Ulcer Following the Billroth I Type of Anastomosis.—This type of Billroth operation has many modifications. However, the principle of these is essentially the same. It consists in removal of the lesion and

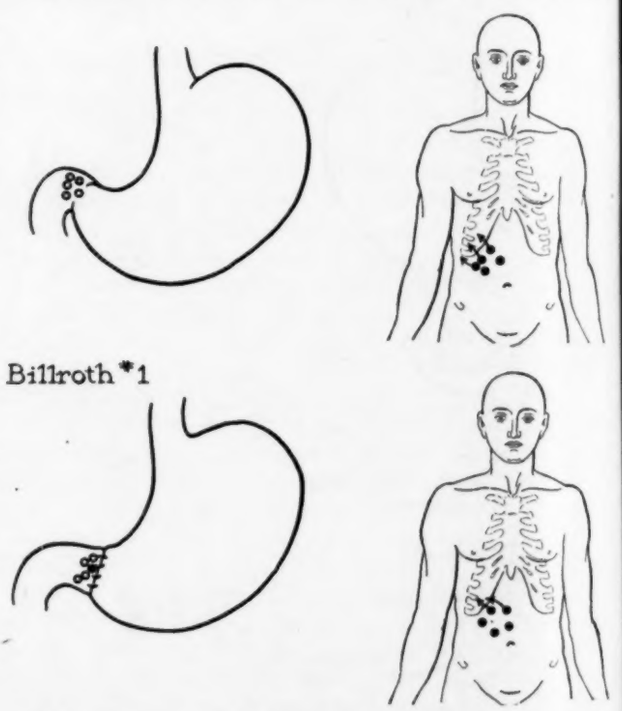

Fig. 6.—Situation of the ulcers and direction of the shifts in pain following performance of the Billroth I type of anastomosis.

the restoration of the gastrointestinal continuity in an end-to-end anastomosis (fig. 6). Some of the patients so treated remained well but recurrences sometimes took place, invariably appearing in the vicinity of the site of anastomosis, usually immediately below the suture line. The marginal ulcer which developed in many of these

patients was often extensive and was complicated not infrequently by hemorrhage or deep penetration. The situation of the original distress was usually definitely to the right of the midline, frequently with reference of pain into the right side of the thorax and back. Recurring ulcers exhibited characteristics almost identical to those for which the operation had been performed. Mechanical difficulties seldom occurred.

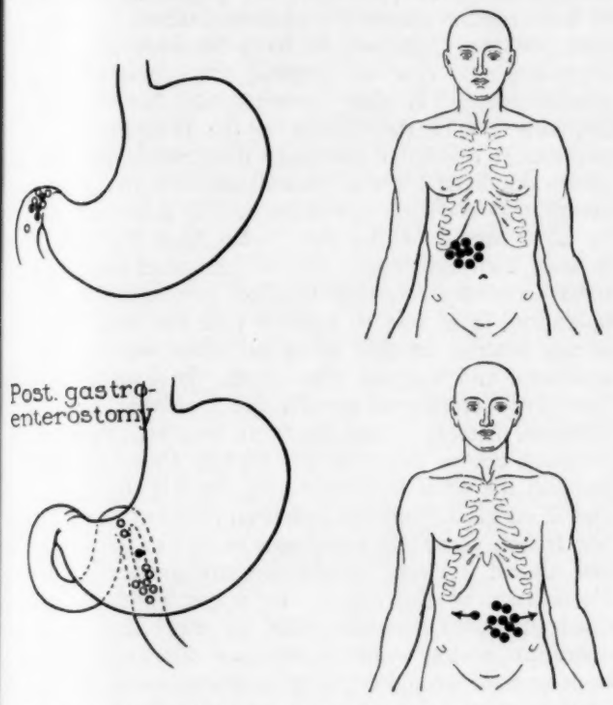

Fig. 7.—Situation of the ulcers and direction of the shifts in pain after posterior gastro-enterostomy for peptic ulcer.

Stomal Ulcers Following Posterior Gastro-Enterostomy.—Posterior gastro-enterostomy still remains the operation of choice in many instances of peptic ulcer. A stoma which is properly placed and which is of proper dimensions aids in the adequate emptying of the stomach (fig. 7). The chemical response within the stomach is usually favorable, so that recurring ulceration rarely takes place. Occasionally, however, this type of operation is followed by results which are not entirely satisfactory. The original ulcer in the duodenum may fail to heal, in which instance there is a recurrence of the original symptoms. The distress is then localized above the umbilicus and to the right of the midline.

In figure 7 we have indicated the situation in which secondary ulcerations occur. Most frequently the ulcer is found just distal to the site of anastomosis, often invading the stoma. Next in frequency are ulcers which are definitely jejunal and are found distal to, or opposite, the site of anastomosis. Rarely does the ulcer develop in the proximal loop just above the gastro-enteric stoma. The symptoms of stomal ulcer are similar to those caused by duodenal or gastric ulcer. In most instances these ulcers are of the penetrating type, and consequently there is less periodicity and less tendency toward remission of symptoms. The pain which develops is poorly defined and poorly localized and often is associated with a sense of intestinal unrest which occurs an hour after the meal. Prior to the development of the pain there is frequently evidence of transitory retention, during which there is loss of appetite, nausea and a vague sense of hypogastric fulness. The situation of pain in uncomplicated gastrojejunal ulcer is usually to the left and slightly above the umbilicus. If penetration takes place, involving the mesenteric side of the organ, there is almost invariably a shift of pain downward to the left and toward the left iliac region. Less frequently it is found in the right iliac or lumbar regions. Occasionally the pain extends into the scrotal region. Extension to the back of pain caused by penetrating jejunal ulcer is usually definitely lower than that experienced with the original lesion.

Stomal Ulcers Following the Devine Type of Antral Exclusion Operation.—This operation is based on the presumption that the most certain indirect means of obtaining a cure of duodenal ulcer is by excluding it from the irritation of all food and gastric secretion. This type of surgical procedure is illustrated in figure 8. In some instances, however, difficulties arose, as not all the acid-bearing portion of the stomach was excluded by the operation and the duodenal ulcer failed to heal. More often recurring difficulties resulted from the development of stomal ulcers involving the anastomosis or approximating it on either the gastric or the jejunal side. The symptomatology of recurring ulceration had characteristics simulating those for which the operation had been performed, although the situation of the distress was usually farther to the left than that caused by the original lesion. A majority of the recurrences were perforating in type, and in these, especially when they were jejunal in situation, there was a shift of pain into the left iliac region.

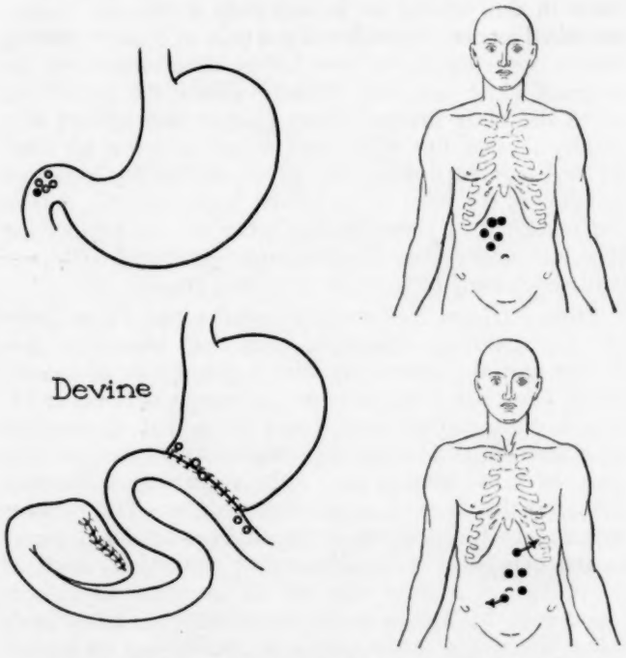

Fig. 8.—Situation of ulcers and direction of the shifts in pain after the Devine type of antral exclusion operation.

Stomal Ulcers Following the Billroth II Type of Anastomosis.—The principle of this Billroth II anastomosis is similar to that of the Devine operation, but a posterior side-to-side anastomosis is made. Occasionally, following this type of surgical treatment, ulcer

developed around the gastro-enteric stoma, as is indicated in figure 9. In one instance an ulcer recurring after this type of operation was gastric in situation. This ulcer may have been overlooked at the time of the operation. In some cases ulceration may have taken

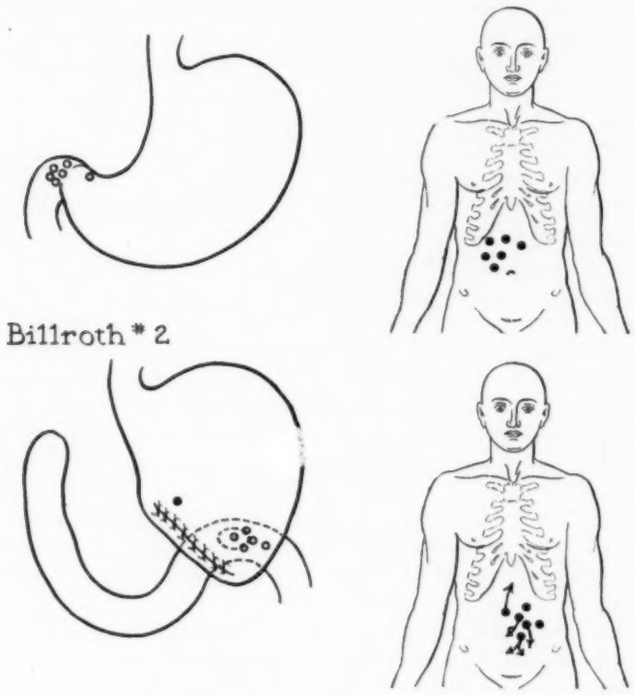

Fig. 9.—Situation of the ulcers and direction of the shifts in pain after performance of the Billroth II type of anastomosis.

place in the jejunal or immediately above the gastrointestinal stoma. Situation of the pain of these recurring lesions was usually to the left of that caused by the original ulcer and was usually above the umbilicus, when the ulcer involved both gastric and jejunal segments. When the ulcer was found to have involved jejunal segments alone, the pain was usually indicated as being at the level of, or below, the umbilicus. Again, the majority of these lesions were of the perforating type and under such circumstances produced a shift of pain downward toward the left iliac region.

Stomal Ulcers Following Resection and Polya Type of Anastomosis.—Although recurring ulceration following partial gastrectomy with a Polya type of anastomosis (fig. 10) is not a common occurrence, nevertheless it does happen sufficiently often that it must be considered in evaluating the symptomatology of patients who present themselves with recurring difficulties following this type of surgical procedure. The patients included in the present study all had duodenal ulcers as the original lesion. Recurring ulcerations such as these usually involve the site of anastomosis or are found near it. Occasionally the recurrence takes place below the site of anastomosis or, rarely, on its gastric side. The pain of which the patients complain is situated to the left and below that caused by the original lesion. In most instances these ulcers perforate more deeply than did the original ulcers, so that the symptoms they produce are more severe and more intractable to measures for obtaining relief than were those of the original lesions. At times a poorly localizable pain persists or develops following other types of operation; it is localized in the left upper abdominal quadrant. This distress reaches its maximum several hours after meals and is somewhat relieved by food or soda. This may be caused by shallow gastric ulcers accompanying a postoperative gastritis.

COMMENT

In evaluating the complaints of the patient who has been operated on previously for peptic ulcer in order to treat such a patient for recurrent ulcers, it is important for the physician to have accurate information regarding the type of surgical procedure which was performed. It is also advantageous for him to be acquainted with the details of the preoperative complaints. A duodenal deformity does not imply that an active duodenal ulcer is present and the persistence of symptoms following operation which were not caused by ulcer would be the rule rather than the exception in such a circumstance. If, on the other hand, symptoms obviously referable to ulcer persist following an operation, it is safe to assume that the original ulcer is not healing or that a second ulcer was present at operation and was not discovered. If scrutiny of preoperative complaints reveals the fact that there was localized distress in two definitely separated regions, for instance, one to the right and slightly above the umbilicus and the other approximating the left costal margin, and if surgical attention had been directed toward only one lesion, persisting symptoms in one of these regions are almost certain to indicate an overlooked ulcer. Persistence of distress in the upper right abdominal quadrant, with characteristics of ulcer following an operation during which an anterior duodenal ulcer had been excised or pyloroplasty performed, indicates with accuracy that a second ulcer, probably on the posterior duodenal wall, was not discovered by the surgeon. If, following an operation performed for an active peptic

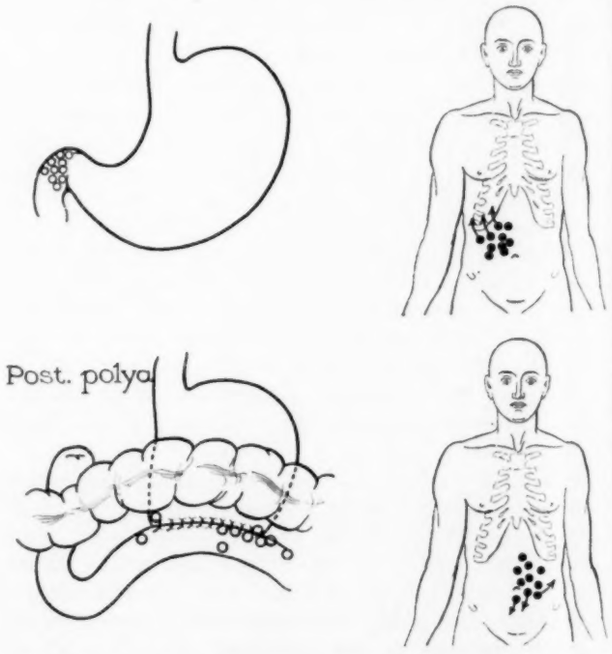

Fig. 10.—Situation of the ulcers and direction of the shifts in pain after performance of resection and a Polya type of anastomosis.

ulcer, the patient enjoys a comfortable period subsequent to which symptoms characteristic of ulcer again result, it remains only to determine where more ulceration has occurred. The situation of the distress and its coincidence with the preoperative region of complaint now becomes important. If the original ulcer was

duodenal and if the region of distress was localized to the right and slightly above the umbilicus, and if the recurring distress conforms in situation to this region, the recurring cause of the complaint is again likely to be duodenal. In the event that the original ulcer was gastric in situation, a recurring ulcer in the same situation would almost invariably cause the reappearance of the complaints which accompanied the original lesion. This is very definitely true if, with the original ulcer, there had been a shifting of pain into secondary regions and if the recurring syndrome included an identical shift of the pain. Roentgenologic investigation remains of paramount importance in the recognition of secondary or recurring ulcers. There are times, however, when accurate and critical studies of situation, type and reference of pain caused by such lesions furnish more accurate information regarding their situation and histopathologic condition than is possible by any other means except direct inspection of tissues.

The closer the recurring ulcer is to the original lesion, the more nearly identical will be the recurring syndrome to the original syndrome. When operations are performed which permanently drain an acid chyme on jejunal mucosa, ulceration occasionally develops in the gastro-enteric stoma or in the jejunal segment contiguous to the new opening. More often this erosion occurs in the path of the draining chyme below the site of the stoma.

If the ulceration occurs at the site of anastomosis, both gastric and jejunal segments may be involved equally, resulting in pain which, although it is situated farther to the left than it would be if the original lesion had been duodenal in situation, is no lower than that experienced by the patient prior to the operation. Should the ulcer, however, develop in the jejunal segment, the situation of the resultant distress usually is in a lower region. When such an ulcer deeply invades tissues, projecting its inflammatory reactions to tissues surrounding the bowel, a secondary shift of pain occurs which is usually definitely lower in situation than the original distress.

The general character of the symptoms produced by the secondary ulcer is similar to that of the first. The pain caused by a shallow peptic lesion is usually difficult to localize unless it produces mechanical disturbances, and this is true regardless of the position of such a lesion. It may produce no pain at all.

A majority of secondary ulcerations, however, tend to penetrate the tissues, and when the deeper tissues of a viscus are invaded there is a tendency for the syndrome to become more definite. The region of pain can usually be indicated with fair precision. With the onset of this secondary pain, other changes in the characteristics of the syndrome experienced by these patients frequently develop. There is less tendency toward intermittence of symptoms, less relief from distress by food or alkalis, earlier onset of pain following meals, and more distress at night. Frequently abdominal tenderness becomes noticeable, and a rather persistent sensation of soreness may develop which usually is maximal over the region of pain. Often this pain does not conform to the usual sequence of pain accompanying ulcer. This is particularly noticeable when extensive inflammatory reactions pass beyond the confines of the bowel and invade tissues surrounding the viscus.

As has been indicated previously, penetration of the ulcer causes projection of pain into secondary regions. This is as true for the secondary as for the primary lesion. The direction of pain projection depends on the situation of the secondary lesion. Thus, if the lesion is in the duodenum, it is projected into the region of the liver or right side of the back. In gastric lesions the pain is projected upward to the left side of the thorax or back. The pain of jejunal lesions is situated at about the umbilicus or slightly to the left of it and shifts downward into the left lower quadrant of the abdomen or, rarely, into the right lower abdominal quadrant.

In recurring ulceration, especially in lesions involving the stoma, more or less obstruction develops and produces distortion of the usual syndrome of ulcer. The "pain-food-ease" sequence is often lacking and the retention type of vomiting may develop. In the presence of such a complication the distress is usually indicated as diffusely spread out over the epigastrium. This is so regardless of the position of the lesion causing the obstruction.

The results of the present study of secondary ulceration tend to confirm such impressions as those which one of us (Rivers) previously expressed concerning the mechanism of the conduction of pain from peptic ulcerative lesions to the spinal cord. Uncomplicated peptic ulcer probably indicates its presence as a visceral phenomenon which asserts itself along the splanchnic nerves. Such a route, however, does not satisfactorily explain the varying shifts of pain that occur when ulcers venture beyond the confines of the bowel. These shifts of pain probably can be explained better by reference to one of the other mechanisms which we have previously discussed. Such mechanisms would include either the phrenic pathway in the case of high-lying perforating gastric lesion or a route along the sensory spinal nerves. Those nerves could be expected to produce a syndrome less rhythmic and clearcut than the syndrome caused by uncomplicated ulcer, since they are sensitive to many stimuli in addition to the "adequate stimulus" producing pain over the splanchnic route.

CONCLUSIONS

1. The situation of the majority of recurring peptic ulcerations is in or near the site of surgical anastomosis if operation has been performed. The physical factor probably determines the site at which the ulcer will develop. The situation of maximal force of impingement of the chyme decides the situation of erosion.

2. The general characteristics of the symptoms of the recurring lesions are similar to those produced by the original lesions.

3. A majority of secondary ulcerations tend to penetrate deeply and, therefore, produce symptoms which are less intermittent, cause more distress at night and are less easily relieved by food and alkali.

4. A great number of recurring lesions involve the site of surgical anastomosis with the production of more or less obstruction, which tends to distort somewhat the usual syndrome for ulcer.

5. Uncomplicated primary or secondary peptic ulcer probably indicates its presence as a visceral phenomenon, which asserts itself along the splanchnic nerves.

6. The projecting pain of perforating peptic ulcers is in all probability the result of direct stimulation of the spinal sensory nerves which produces referred pain in the distribution of the more highly differentiating peripheral or cutaneous branches of these nerves.

7. When a gastric ulcer begins to produce pain in the tip of the shoulder, indicating use of the phrenic pathway, it can be assumed that deep penetration or active perforation has occurred.

THE EFFECT OF MERSALYL (SALYRGAN) ON PLASMA VOLUME

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In association with the diuresis obtained by mercurial diuretics in cases of congestive heart failure, two strikingly curious phenomena are often observed. Shortly after the intravenous injection of 2 cc. of salyrgan in cases responding to it there is promptly an increased excretion of water which reaches its highest point sharply and then recedes with equal suddenness. Occasional cases are encountered in which the onset of diuresis is slow and its duration longer. In general, however, the outstanding feature of the effect of such diuretics is the sharpness of the reaction and its relative shortness of duration. This fact is well demonstrated in chart 1.

Five patients with varying degrees of congestive heart failure were given by vein 2 cc. of salyrgan. They were asked to empty their bladders at hourly intervals thereafter and the amount of urine excreted in each instance was measured and tabulated on the basis of cubic centimeters of urine excreted per minute during the period of observation. In each instance the severity of the diuresis so induced varied though the general trend of the curve was the same. Along with the increased excretion of water that may follow the injection of salyrgan there is also a sharp increase in the excretion of sodium chloride and to a less extent of nitrogen. The most striking clinical response to a mercurial diuretic therefore is the rapid excretion of large amounts of water and sodium chloride, which takes place during a relatively short period of time after the drug is injected.

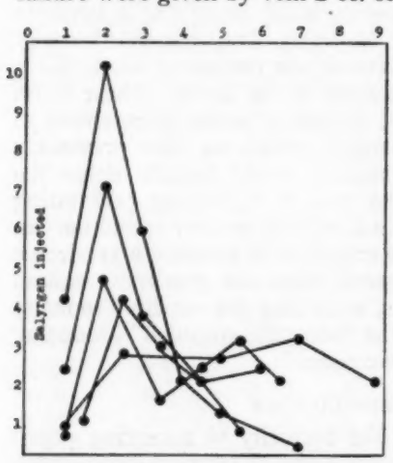

Chart 1.—The diuretic effect of salyrgan, expressed in rate of excretion by urine per minute during a period of several hours after the drug was injected.

There has been a lengthy debate concerning the precise manner in which these well known responses to the diuretic effect of mercury are brought about. When merbaphen (novasurol) first came into clinical use Saxl and Heilig,[1] Nonnenbruch,[2] Bohn [3] and Crawford and McIntosh [4] made observations which led them to believe that an important action of the drug was on the extrarenal tissues and that the diuresis developed secondary to a temporary hydremia. In contrast, this idea was not accepted by Govaerts,[5] by Christian and Bartram,[6] by Bryan, Evans, Fulton and Stead,[7] by Blumgart, Gilligan, Levy and Brown [8] or by Evans and Gibson.[9] These several investigators independently have carried out a series of ingenious experiments which were interpreted to show that the diuretic effect of mercury is due primarily to its action on the kidney, any action on the tissues and blood volume, if this exists at all, being accessory and of minor importance.

In 1937 Gibson and Evans [10] described a new method for estimating plasma volume. In brief, this consists in the employment of an azo dye, "Evans blue," with the determination of its concentration in plasma by the spectrophotometer. They claim that this method is accurate, that it avoids many of the errors inherent in dye methods previously in clinical use for the determination of plasma volume and that, on the whole, it can be employed advantageously in the investigation of a variety of clinical problems. Already they and their collaborators have used this method with pertinent results in several studies.

In the fall of 1937 Dr. Gibson was kind enough to teach us the technic of this method in his laboratory at the Peter Bent Brigham Hospital in Boston. Since then at the Robert Dawson Evans Memorial about 300 plasma volume determinations have been made. In each, Gibson's technic as modified by Gibson and Evelyn [11] has been followed meticulously. In our hands, just as has been the experience of Gibson and his co-workers, the method has seemed reliable and has appeared to yield consistent results in different clinical states in which changes in blood volume appear to play a significant part.

It occurred to us that it would be interesting once more to investigate the effect of a mercurial diuretic like salyrgan on blood volume by the means of so accurate a clinical method for estimating blood volume as Gibson's method appears to offer. With this idea in mind seven cases have been studied, certain of them being studied repeatedly. The group included four cases with edema primarily of cardiac rather than renal origin, one case with more nearly renal edema, one normal individual, and one patient recovering from secondary anemia. The general plan of work was as follows:

Early in the morning of the experimental day the patient to be observed was treated in the following manner: A blood sample was withdrawn on which was determined the concentration of albumin and globulin in the plasma and of sodium in the serum. The concentration of chloride, of nonprotein nitrogen and of iron was determined in whole blood, and a red cell count

From the Robert Dawson Evans Memorial for Clinical Research and Preventive Medicine, Massachusetts Memorial Hospitals.

Read before the Section on Pharmacology and Therapeutics at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

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2. Nonnenbruch, W.: Ueber die Wirkung des Novasurols auf Blut und Diurese, München. med. Wchnschr. **68**: 1282-1283 (Oct. 7) 1921.
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4. Crawford, J. H., and McIntosh, J. F.: Observations on the Use of Novasurol in Edema Due to Heart Failure, J. Clin. Investigation **1**: 333-358 (April) 1925.
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6. Christian, H. A., and Bartram, E. A.: Experimental Observations on the Action of Diuretics, Tr. A. Am. Physicians **47**: 292-303 (May) 1932.
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8. Blumgart, H. L.; Gilligan, D. R.; Levy, R. C., and Brown, M. G.: The Effect of Diuretics on Water and Salt Metabolism, Tr. A. Am. Physicians **47**: 304-307 (May) 1932.
9. Evans, W. A., Jr., and Gibson, J. G., 2d: The Blood Volume in Diuresis, Am. J. Physiol. **118**: 251-259 (Feb.) 1937.
10. Gibson, J. G., 2d, and Evans, W. A., Jr.: Clinical Application of a Method Employing the Blue Azo Dye "Evans Blue" and the Spectrophotometer, J. Clin. Investigation **16**: 301-316 (May) 1937.
11. Gibson, J. G., 2d, and Evelyn, K. A.: Clinical Studies on the Blood Volume: IV. Adaptation of the Method to the Photoelectric Microcolorimeter, J. Clin. Investigation **17**: 153-158 (March) 1938.

was made. A plasma volume determination was then performed and from it and the hematocrit reading was estimated the total blood volume. As soon as the blood necessary for this observation was obtained, 2 cc. of salyrgan was injected by vein. At various intervals up to four hours after the injection of the drug a second series of blood studies was repeated and a second plasma and blood volume determination was made. Other blood samples for chemical studies and blood counts were withdrawn at intervals during the six hour period in which most active diuresis seemed likely to occur. On the following morning a final series of blood chemical studies and a third plasma and blood volume determination was made.

The amount of urine excreted during the interval between the various bleedings was measured, as was the total volume excreted during the twenty hour cycle. The patient was allowed to eat stipulated amounts of food and to drink a measured fluid intake. The patient was weighed at the beginning of the procedure and twenty-four hours later.

The total amount in circulation of the various blood components studied was charted at different time intervals during the period of diuresis on the basis of the plasma and blood volume estimation figures, interpolations for these being made when blood samples were withdrawn at times other than when blood volume determinations were actually made. In this manner we hoped to develop data which would tend to illustrate what happens to the composition of the blood during the period in which an active diuresis from mercury is being induced.

For technical reasons it was impossible in each case to make in perfect detail each of the observations outlined. The trend of our results, however, with illustrative data is reported.

Our results in relation to the plasma and blood volume following an injection of salyrgan varied, as may be seen by table 1.

TABLE 1.—*The Effect of Salyrgan on Plasma Volume*

Number	Time	Plasma, Cc.	Per Cent of Corpuscles	Blood, Cc.
	1. Cases with No Significant Changes in Plasma and Blood Volume			
1	Before salyrgan	2,680	35	4,120
	4 hours later	2,600	37	4,130
2	Before salyrgan	2,730	29	3,850
	24 hours later	2,630	27	3,600
3	Before salyrgan	2,550	42	4,400
	2 hours later	2,640	42	4,550
	24 hours later	2,570	43	4,510
	2. Cases with First a Gain in Plasma and Blood Volume Followed by Secondary Loss			
1	Before salyrgan	2,870	29	4,040
	3½ hours later	3,060	28	4,250
	24 hours later	2,540	28	3,530
2	Before salyrgan	2,920	33	4,360
	1½ hours later	3,630	32	5,340
	24 hours later	2,630	31	3,810
	3. Cases with Loss in Blood and Plasma Volume			
1	Before salyrgan	2,990	50	5,980
	2 hours later	2,750	51	5,390
	24 hours later	2,600	51	5,100
2	Before salyrgan	3,460	45	6,290
	4 hours later	3,260	45	5,930
	24 hours later	3,080	44	5,500
3	Before salyrgan	3,660	42	6,310
	24 hours later	3,020	41	5,120
	4. Cases with Gain in Blood and Plasma Volume			
1	Before salyrgan	2,330	28	3,240
	2½ hours later	2,470	29	3,480
	24 hours later	2,760	27	3,780
2	Before salyrgan	3,450	41	5,850
	2 hours later	3,620	42	6,240
3	Before salyrgan	2,420	40	4,030
	24 hours later	2,670	41	4,540

TABLE 2.—*The Effect of Salyrgan on Venous Pressure, Vital Capacity and Circulation Time*

Name	Diagnosis	Date	Venous Pressure, Mm. Water	Vital Capacity, Cc.	Circulation Time, Sec.	Time
T	Normal.....	May 18	85	3,800	11.5	Before salyrgan
			—	3,750	12	1 hour later
			65	3,800	11	24 hours later
M	Pyelonephritis; cardiac and renal edema	Jan. 24	160	1,100	13	Before salyrgan
			148	1,150	14	3 hours later
			185	1,100	10	24 hours later
		Feb. 9	130	1,700	16	Before salyrgan
			95	1,600	18	4 hours later
			—	1,700	19	24 hours later
		June 1	103	1,950	16.5	Before salyrgan
			90	1,500	16	2 hours later
			110	1,500	13	24 hours later
P	Congestive failure	May 1	120	3,100	25	Before salyrgan
			115	2,800	27	1 hour later
			—	3,300	21	24 hours later
S	Congestive failure	June 13	58	1,700	36	Before salyrgan
			45	1,625	36	1 hour later
			80	1,850	35	24 hours later
W	Congestive failure	Feb. 24	100	1,400	16	Before salyrgan
			95	1,400	20	6 hours later
McM	Secondary anemia	April 3	100	3,000	17	Before salyrgan
			—	2,600	14	1½ hours later
			75	2,950	14	24 hours later
N	Congestive failure	March 13	85	1,150	45	Before salyrgan
			105	1,100	46	3½ hours later
			80	1,400	—	24 hours later
		April 25	105	1,050	30	Before salyrgan
			95	1,100	47	1½ hours later
			105	1,150	44	24 hours later
		May 4	135	1,200	49	Before salyrgan
			180	1,150	49	1½ hours later
			120	1,300	44	24 hours later

There were three instances in which there was no significant change in plasma or blood volume. There were two instances in which there appeared shortly after the injection of the diuretic an initial gain in plasma and blood volume followed later by a significant loss in circulating blood. There were three instances in which, following the injection of the drug, there appeared to develop a steady and significant loss in plasma and blood volume. There were three instances in which there appeared to develop a steady and significant gain in blood and plasma volume. In brief, our results were entirely inconsistent and appeared to follow no readily comprehensible pattern. Nor is our experience unique: other workers with the problem have faced the same quandary. Brown and Rowntree,[12] studying the volume and composition of the blood by the congo red method and the changes incident to diuresis in cases of edema, found, as did we, that during diuresis changes in blood volume may occur in any direction—there may develop an increase or decrease or no change in blood and plasma volume. Fehér,[13] making volume determinations with trypan red three hours after salyrgan injections, found at the height of the diuresis an increased volume: on the other hand, Goldhammer, Leiner and Scherf,[14] making blood volume

12. Brown, G. E., and Rowntree, L. G.: The Volume and Composition of the Blood and the Changes Incident to Diuresis in Cases of Edema, Arch. Int. Med. **35**: 129-146 (Jan.) 1925.

13. Fehér, S.: Salyrgandiurese und zirkulierende Blutmenge, Wien. klin. Wchnschr. **42**: 964-965 (July 18) 1929.

14. Goldhammer, S.; Leiner, G., and Scherf, D.: Ueber die zirkulierende Blutmenge vor und nach der Quecksilberdiurese, Klin. Wchnschr. **14**: 1109-1112 (Aug. 3) 1935.

determinations twenty-four hours after the injection of a mercurial diuretic and using both the carbon monoxide and trypan red methods, found regularly a loss in blood and plasma volume. And somewhere in between were Borruso and Ceccarelli, who, according to Goldhammer and his colleagues, found shortly after the onset of diuresis a diminished blood and plasma volume followed later by an increased volume.

The explanations given for such contradictory observations have differed widely. From the point of view of common sense the reasoning first put forth by Brown and Rowntree remains as satisfactory as any: during a sudden diuresis evanescent blood volume changes easily may take place as the result of rapid contraction or expansion of blood volume from dilution or concentration of the blood; and variable transitory adjustments in blood volume, in blood solids or fluid factors may be relative sodium retention in comparison with the loss of chloride. There was an initial fall in plasma albumin followed by a secondary rise in spite of the fall in plasma volume. During the first few hours there was a relative rise in the plasma globulin so that for at least three hours after the drug was injected there was a reversal of the albumin-globulin ratio. Eventually this became corrected. The initial fall in chloride, sodium and globulin occurred before diuresis was established; but at the same time there was a loss of plasma volume which does not suggest an immediate mobilization of fluid into the blood stream. Rather, this isolated observation is in agreement with the view of Schmitz [15] and others, who believe that the primary action of salyrgan is on the kidney with a secondary inflow of fluid from the tissue spaces to prevent excessive dehydration of the plasma.

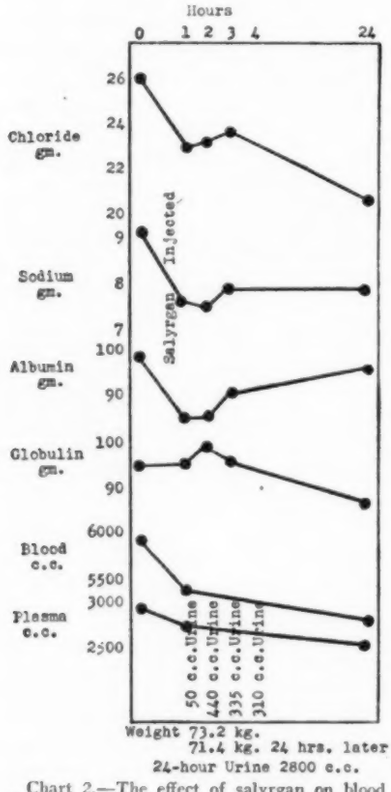

Chart 2.—The effect of salyrgan on blood chemistry.

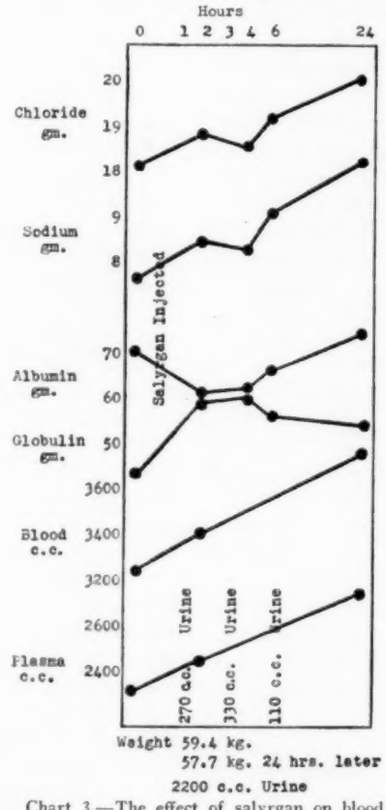

Chart 3.—The effect of salyrgan on blood chemistry.

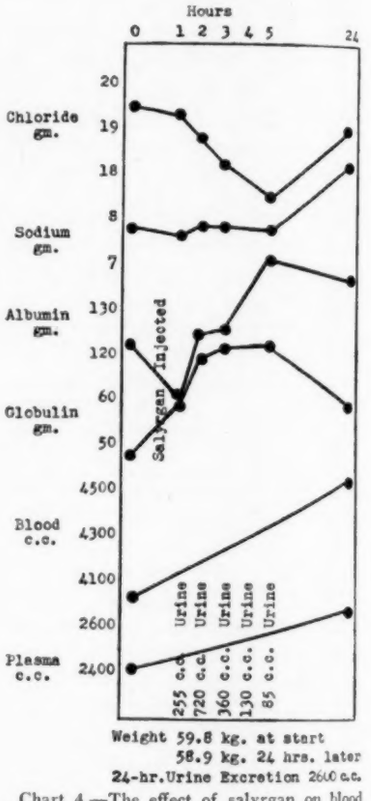

Chart 4.—The effect of salyrgan on blood chemistry.

partially or completely masked by fluctuations in the water content of the blood in the absence of any demonstrable volume changes. One fact remains fairly well established: the injection of salyrgan is likely to be followed fairly promptly by significant changes in the amount of plasma and blood in circulation.

From the chemical data assembled by the methods outlined, the level of blood iron, nonprotein nitrogen and red cells showed only minor and insignificant fluctuations. These figures have been omitted as being unrevealing. The figures in relation to sodium, chloride, albumin and globulin were more noteworthy and are tabulated from three illustrative cases:

The first patient, P., a man in congestive failure, developed a loss in blood and plasma volume following the injection of the diuretic. There developed an immediate fall in blood chloride followed by a slight secondary rise and then a more marked fall as the loss in blood volume continued. There was an initial fall in the serum sodium. But later there appeared to develop a

The second patient, M., a woman with edema from a combination of myocarditis and chronic pyelonephritis, developed an increased blood and plasma volume following the injection of the diuretic. In this instance the diuresis began promptly. There was a steady increase in circulating chloride and sodium and no evidence of any relative sodium retention. There was an initial fall in the circulating albumin followed by a secondary rise: and again a transitory reversal of the albumin-globulin ratio during the period of most active diuresis.

The third patient, McM., a woman recovering from secondary anemia, developed an increase in blood and plasma volume after the diuretic was injected. There was an initial fall in the circulating chloride followed by a secondary rise. There was relative sodium retention. There was an initial fall in the plasma albumin

15. Schmitz, H. L.: Studies on the Action of Diuretics: II. The Effect of Salyrgan on the Water Content of the Plasma as Measured by the Refractive Index, J. Clin. Investigation **12**: 741-749 (Sept.) 1933.

followed by a secondary rise. There was a transitory reversal of the albumin-globulin ratio during the period of active diuresis, normal relationship becoming reestablished in twenty-four hours. In this case there was an immediate diuresis, reaching its peak during the second hour after the diuretic was injected.

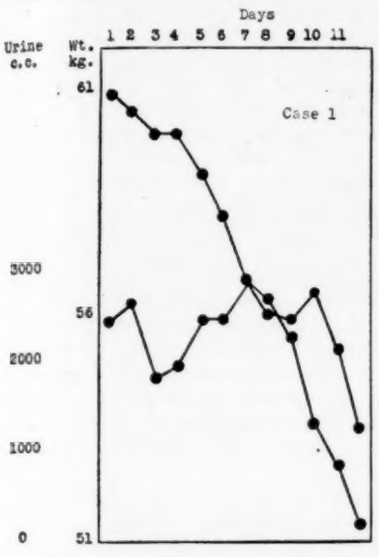

Chart 5.—The effect of mercupurin on urinary output and body weight: In case 1 the drug was injected in three small doses each day. There was a well sustained diuresis and the weight loss followed a fairly straight line.

The behavior of the albumin and globulin in these three cases is worthy of comment, for it is contradictory to Schally's[16] work. This investigator found an increase of the blood albumin after salyrgan injection, explaining his observations on the theory that in order for water to get from the tissue spaces into the capillary circulation albumin must be mobilized as well.

Our experiences, if they do nothing else, emphasize the difficulties entailed in any attempt to rationalize by clinical methods the complexities of a diuresis as acute as that produced by salyrgan. But at least they give evidence to show that in connection with the rapid excretion of large amounts of water and sodium chloride after salyrgan there may develop in the blood stream at the same time not only changes in the volume of the circulating blood which are significant but also significant changes in its chemical and physical composition.

Finally our observations bring to light certain practical implications regarding the best use of the mercurial diuretics. Throughout this study the circulation time by the decholin method, the vital capacity and the venous pressure was estimated at the time of each plasma volume determination. The results of these observations are of some interest.

The circulation time after salyrgan in most cases was slightly diminished twenty-four hours after the drug was injected but tended to be slightly prolonged when determined during the time of active diuresis. The vital capacity also tended to be slightly diminished when estimated during the time of active diuresis though increased at the end of the twenty-four hour period. The increases in vital capacity observed in our cases after salyrgan were not as pronounced as in the cases reported by Alsever and Levine;[17] however, the general effect of salyrgan on this particular type of observation was the same in the two series.

The venous pressure in most instances tended to fall after diuresis was established, and usually twenty-four hours later to continue lower than before the diuretic was administered, an observation in agreement with Volini and Levitt's[18] experience. There were exceptions, however, when the immediate effect of the diuretic appeared to be such as to cause temporarily a rise in venous pressure. There was one notable example of this reaction, patient N., on May 4, whose venous pressure rose from 135 mm. of water to 180 mm. a few hours after salyrgan was injected. And for a few bad minutes at the time, the patient was dyspneic and thoroughly uncomfortable. Our blood volume determination at this juncture was imperfect. We suspected, however, that the patient was one of those whose immediate response to salyrgan was an increased blood volume and that such an additional load was more than his circulation could manage comfortably.

Since from our experience it appears unpredictable what may be the immediate effect of a mercurial diuretic such as salyrgan on the blood volume and since striking changes in volume which are potentially harmful may occur quickly, it appears wise to continue with the use of such drugs conservatively and when they are first administered to continue the custom of testing each patient's individual susceptibility to them by the method of graded dosage.

It is possible that salyrgan or other mercurial diuretics may be administered more advantageously in small daily doses over a short period of time than by the single large dose method usually employed when the drug is given at three or four day intervals over a long period. The disadvantage with the traditional way of using a diuretic like salyrgan lies in the intermittence of the diuresis produced. A period of sharp diuresis is

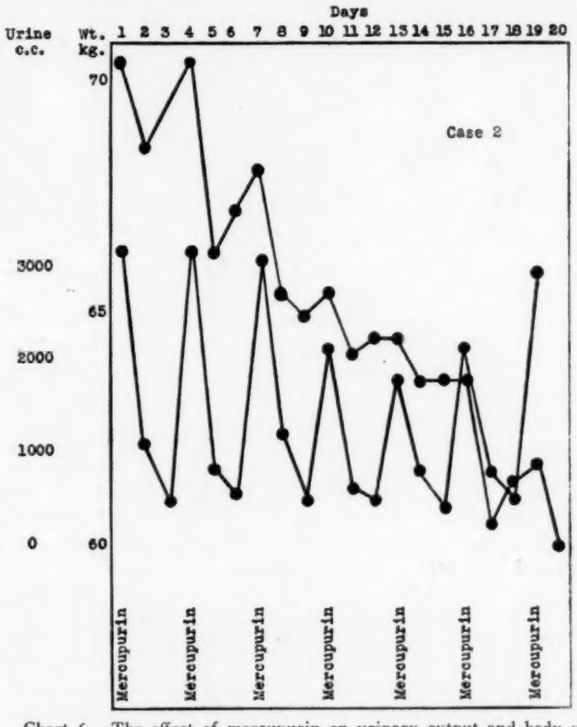

Chart 6.—The effect of mercupurin on urinary output and body weight: In case 2 the drug was injected according to usual precedent in a single dose at three day intervals. The diuresis was intermittent and irregular, as was the loss in weight. The daily fluid intake was constant in both observations. The total amount of drug injected was the same in the two instances.

apt to be followed by a period of relative oliguria and redevelopment of edema. In theory the most effective results from these drugs would be obtained by so grading their dose and its timing that while the drug is in

16. Schally, A. O.: Veränderungen der Bluteiweisskörper bei der Salyrgandiurese, Deutsches Arch. f. klin. Med. **177**: 368-376 (Dec.) 1934.

17. Alsever, J. B., and Levine, S. A.: The Immediate Effect of Mercurial Diuretics on the Vital Capacity of the Lungs, Am. Heart J. **15**: 200-205 (Feb.) 1938.

18. Volini, V. F., and Levitt, R. O.: Studies on Mercurial Diuresis: II. The Immediate Effect on the Venous Blood Pressure, Am. Heart J. **17**: 187-193 (Feb.) 1939.

operation no noteworthy change in the plasma or blood volume develops and at the same time a continuous rather than intermittent diuresis is maintained.

With this idea in mind a few patients in congestive failure and with cardiac edema have been treated over a ten day period with three injections of mercupurin each day, each dose containing 0.5 cc. of the drug. Mercupurin instead of salyrgan was used as a mercurial entirely by chance. The results of these experiments are promising. A steady rather than intermittent diuresis developed and the patients' weight loss also followed a straight rather than a crooked line. The continued use of the diuretic in this manner did no harm: hematuria or other signs of renal irritation did not develop and the concentration of nonprotein nitrogen in the blood did not increase. Subjectively the patients felt notably improved.

CONCLUSION

Studies were undertaken to reinvestigate the effect of salyrgan on plasma and blood volume. The injection of salyrgan may be followed by significant changes in plasma and blood volume which seem inconsistent and which appear to follow no definite pattern. Possibly the sudden increase in blood volume which may occur following the injection of salyrgan is a handicap to a badly diseased heart. Methods of using the mercurial diuretics to avoid abrupt shifts in blood volume and to establish a continued moderate diuresis are possible and seem more logical than to administer such drugs so as to produce a transitory and even uncomfortable diuresis followed by a period of relative oliguria.

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ABSTRACT OF DISCUSSION

DR. LEONARD G. ROWNTREE, Philadelphia: The experiments which have just been reported were broader and more comprehensive in scope than the experiments which Dr. George Brown and I carried on in this connection some fifteen years ago. Dr. Fitz was not satisfied with attempts at measuring plasma and blood volume; he took cognizance of the possibility of dilution phenomena; but even with this added bow to his string it was not possible to arrive at a definite conclusion as to a single mechanism. Apparently there is no one single pattern of change which accompanies the diuresis resulting from this drug. It seems to me that it is within the realm of possibility that the initial state of the blood and plasma may be at least one factor in determining what happens. Dr. Brown and I found, in experiments carried on at that time, that there were great differences in the blood and plasma as we encountered it in different types of edema. For instance, we had edema with low blood volume and low plasma volume and with normal values. We also saw edema with high plasma volume with dilution, and high plasma volume without dilution. These facts may be significant, but I do not believe that they constitute the controlling factor. As a result of all our studies we came to this conclusion, and I would like very much to get the thought of Dr. Swigert and Dr. Fitz on this matter. On the one side there is an edematous body, the kidney, and in between the plasma. One gives this drug and sees the effect, and one comes to the conclusion that the plasma might be just a passive agent and that the effects of the drug are primarily on the tissues or on the kidney, and hence whatever happened to them determined what was happening in the blood volume. The most important part of this contribution is the new method suggested for utilizing these mercurial compounds. I believe that the new method of getting results is infinitely better. It seems that Dr. Swigert and Dr. Fitz started out to do one thing but did not accomplish their purpose very successfully. However, during the process they did something which was more important than what they started out to do. They sought a scientific explanation of diuresis but devised a better method of treatment, a method which should prove of great value to patients with edema. I should like to ask Dr. Fitz whether he thinks the role of plasma is active or passive. And has he seen any toxic effects from this newer method of employing the drug? Particularly has he seen collapse or hemorrhage attending its use?

DR. MAURICE BRUGER, New York: I should like to discuss the modus operandi of mercury diuresis. Although the markedly increased chloride excretion in the urine after the administration of mercury salts is generally appreciated, one frequently fails to realize how pronounced this may be at times. Some eleven years ago, I recall, Dr. Melville and I, while investigating antidotes for mercury bichloride poisoning, injected intravenously 1.2 mg. of mercury bichloride per kilogram into a dog with a bladder fistula. The increased chloride output in the urine was enormous. The control chloride output was 0.013 mg. per minute and within two hours this had increased to 22.4 mg. per minute, representing an increase of some 1,700 per cent. This speaks strongly for the extrarenal factor in mercury diuresis. It was Govaerts, I believe, who by kidney transplant experiments showed that a definite renal factor to account for mercury diuresis also exists. Drs. Swigert and Fitz noted that active salyrgan diuresis frequently placed an extra load on the already impaired heart. Was theophylline ever added to the salyrgan and if so was there any noticeable difference in cardiac efficiency during active diuresis?

DR. GEORGE R. HERRMANN, Galveston, Texas: Our experimental biologist, D. B. Calvin, has been working with this method of blood volume study for the past five years on problems of diuresis in animals. During the past year he has joined G. M. Decherd Jr. and me in a clinical restudy of diuresis mechanisms employing the plasma volume method of Gregerson, Gibson and Stead as modified by Gibson and Evans and by Gibson and Evelyn. In Calvin and Decherd's study in cases of edematous heart failure there weren't so many inconsistencies as Drs. Swigert and Fitz encountered. There were very definite and different trends of plasma shifts following salyrgan and aminophylline and a glucoside from Digitalis lanata. We have been interested for a long time in the different mechanisms of the various types of diuretics. In a large series of experiments, some fifteen, with the mercurial salyrgan, there was practically always an early and sustained concentration in the plasma volume that seemed to parallel diuresis. In only two cases were the results discordant. In one case no diuresis followed salyrgan and the plasma volume increased slightly. In the other case a delayed and temporary slight rise in plasma volume was recorded with a subsequent fall as soon as there was an augmentation of the urinary flow. Comparable studies with aminophylline revealed strikingly different plasma volume responses. Immediately after the intravenous aminophylline 0.5 Gm. there was a slight fall followed promptly and uniformly by a conspicuous rise in blood volume, increases considerably greater than those reported by Drs. Swigert and Fitz. This great increase in plasma volume following 0.5 Gm. (7½ grains) of aminophylline intravenously suggested divided dosage as a safety measure. During the time of the most profuse diuresis there was a characteristic tendency in the plasma volume to return toward the initial level. There was a shift in the plasma volume, apparently dependent, in part at least, on the balance established between the tissue fluid mobilization and the urinary output. The end result is usually plasma volume lower than that initially observed. With the glucoside, on the other hand, 2 mg. intravenously for patients with congestive failure, there was a shift in the plasma volume apparently according to the promptness and degree of the myocardial effect of the digitalis preparation. When there was immediate response the plasma volume decreased sharply as a satisfactory urinary output developed. When delayed, the plasma volume remained practically unchanged or increased slightly until diuresis was inaugurated, at which time it decreased.

DR. VERNE W. SWIGERT, Evanston, Ill.: The questions raised in discussion are still unsettled. Further work with regard to the mercurial diuretics and their behavior must be continued.

CHALK GOUT

A REPORT OF TWO CASES WITH A BRIEF SUMMARY OF SOME PREVIOUSLY REPORTED STUDIES ON CALCINOSIS

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ROCHESTER, MINN.

The term "chalk gout" is occasionally used to designate a rare disease more generally known as "calcinosis circumscripta." In this condition calcium stones develop in the skin in the vicinity of peripheral joints.

Extensive reviews of the subject of calcinosis have been published during the past two decades: in Germany by Steinitz,[1] in America by Durham[2] and by Rothstein and Welt,[3] in France by Weissenbach and his co-workers[4] and in England by Atkinson and Weber[5] and by Brooks.[6] The first report of this disease in modern medical literature appeared in 1877 (Teissier[7]). However, Holländer[8] has republished a curious record dated 1654 in which reference is made to a probable instance of this disease.

Steinitz distinguished two clinical types of calcinosis: (1) a circumscribed variety in which the calcium concretions are confined almost exclusively to the regions of the terminal phalanges of the fingers and toes and to the extensor portions of knees and elbows and (2) a diffuse or "universal" calcinosis in which the deposits are widely disseminated. In the diffuse type large portions of the skin may be converted into calcareous plates, or great fluctuant inflammatory masses may appear over which the skin may ulcerate and permit the discharge of gritty, chalk-like material. Interstitial tissues of muscles, tendons and nerve sheaths may be involved in the "universal" types. Internal viscera, however, are spared in both types of calcinosis. In practice, the distinguishing of two types has been applicable only to characteristic instances of the condition. Many individuals have been encountered in whom the pathologic picture was intermediate, fitting neither the circumscribed nor the diffuse type. The condition of these patients has been designated as "transitional." To the present, no constant metabolic or pathologic abnormalities have been found which distinguish either type of chalk gout. Conflicting reports on this phase of the problem have appeared, and the mechanism by means of which calcium is deposited in both types is uncertain.

Fig. 1 (case 1).—The fingers are diffusely enlarged and there is slight flexion contracture at the interphalangeal joints. Over the terminal joints are elevations caused by the underlying chalk stones. The skin over the fingers is tense, firm and shiny and shows scars resulting from the ulceration of previous deposits of calcium.

In 1938 Atkinson and Weber collected 137 cases of circumscribed calcinosis and seventy-eight of the universal type from the world literature. It appears that information concerning calcinosis must be sought in medical writings by searching under a great variety of names, among which are "tendino-fasciitis calcarea rheumatica," "tendinitis calcarea," "petrificato cutis," "calcinosis interstitialis" or "calcinosis universalis," "Raynaud's disease with calcareous degeneration" and "subcutaneous calcareous granulomata."

Chemically, the chalk stones have been found to consist mainly of calcium phosphate and calcium carbonate. These compounds are generally present in the same proportion as in bone. Small amounts of magnesium carbonate and phosphate, cholesterol and fatty acids have also been found in the deposits.

SPECIAL FEATURES OF CALCINOSIS CIRCUMSCRIPTA

The term "chalk gout" was suggested by Minkowski,[7] and perhaps independently by Wichmann.[9] Each, however, used the term "gout" in a different sense. To Minkowski the disease seemed to deserve designation as a form of gout because the deposits near joints of stonelike calcium concrements resembled the tophaceous deposits of true uratic gout. Wichmann used the term "gout" because he believed that the disease resulted from a special metabolic fault—calcium diathesis analogous to uratic diathesis. Wichmann's contention is not yet proved.

CLINICAL FEATURES OF CALCINOSIS CIRCUMSCRIPTA

Usually this disease runs a mild course. It appears most frequently in elderly persons and somewhat more often in women than in men (in fifty-seven of seventy-one cases collected by Steinitz the patients were females). The disease develops insidiously. Stiffness and aching of joints appear in the affected regions, and the subcutaneous deposits of calcium develop slowly. Calcified regions may or may not be painful. The physician may encounter the deposits by chance in the study of roentgenograms. According to Steinitz, scleroderma or sclerodactylia accompanies calcinosis circumscripta in more than 40 per cent of cases and, as is true in uncomplicated scleroderma, vasospastic phenomena involving the digits occur commonly. These vasospastic symptoms may take the form of characteristic attacks

1. Steinitz, Hermann: Calcinosis circumscripta ("Kalkgicht") und Calcinosis universalis, Ergebn. d. inn. Med. u. Kinderh. **39**: 216-275, 1931.
2. Durham, R. H.: Scleroderma and Calcinosis, Arch. Int. Med. **42**: 467-490 (Oct.) 1928.
3. Rothstein, J. L., and Welt, Sara: Calcinosis Universalis and Calcinosis Circumscripta in Infancy and in Childhood: Three Cases of Calcinosis Universalis, with Review of the Literature, Am. J. Dis. Child. **52**: 368-422 (Aug.) 1936.
4. Weissenbach, R. J.; Basch, Georges, and Basch, Marianne: Essai critique sur la pathogénies des concrétions calcaires des sclérodermies (syndrome de Thibierge-Weissenbach) et des syndromes voisins, Ann. de méd. **31**: 504-529 (May) 1932.
5. Atkinson, F. R. B., and Weber, F. P.: Cutaneous and Subcutaneous Calcinosis, Brit. J. Dermat. **50**: 267-310 (June) 1938.
6. Brooks, W. D. W.: Calcinosis, Quart. J. Med. **27**: 293-319 (July) 1934.
7. Quoted by Steinitz.[1]
8. Holländer, Eugen: Ueber Kalksteingicht, Deutsche med. Wchnschr. **1**: 431-433 (April 5) 1917.
9. Wichmann, Walther: Ein Fall von Kalkablagerungen unter der Haut (Kalk-Gicht), Berlin, E. Ebering, 1910.

similar to those of Raynaud's disease, with the usual series of changes in color involving the acral regions. Some patients complain only of blueness or coldness of the extremities. Ulceration of the skin may occur over the nodules, even in the circumscribed type of the disease, and extrusion of the calcareous material may result.

The Joints.—Descriptions of the status of the joints in patients suffering from calcinosis circumscripta have been very meager in most reports dealing with this disease, although it has been stated commonly that the affected individuals complain of pains in the joints. Costello's [10] patient had "generalized arthritic pains with swelling and thickening of the fingers and toes." Atkinson and Weber stated that the joints are unaffected, meaning that intra-articular disease does not occur. Rothstein and Welt, in their review of calcinosis in children, stated that in one of twenty cases the joints were fixed and motion was limited by the development of contractures. Calcific deposits were found within the joints in two cases. "Chronic arthritis deformans" caused an irregularity and deformity in the articulating surfaces in one case reviewed by these authors. Thus it would appear that the disease is but rarely associated with the syndrome of progressive chronic atrophic arthritis.

PATHOGENESIS

The mechanism by means of which deposition of calcium develops is unknown. The numerous hypotheses which have been advanced may be divided into two types. The first considers the disease to be a metabolic disorder analogous to uratic gout; the disease is thought to be based on an alteration in calcium chemistry. The second hypothesis holds that the deposition of calcium results after local changes have taken place in connective tissue of such a nature that an increase in affinity for calcium salts exists in the damaged portions. Exponents of both arguments have been unsuccessful thus far in accumulating conclusive evidence. Against the "humoral" theory are the facts that (1) the bony skeleton is usually intact, (2) determinations of the values of various organic and inorganic constituents of the blood have, for the most part, given normal results, (3) experiments in which hypercalcemia was secured by the administration of irradiated substances and extracts of parathyroid tissue have not reproduced a syndrome like calcinosis and (4) metabolic studies of calcium in patients who have calcinosis have often yielded normal results, and when abnormal effects have been noted there has been no general agreement concerning, or satisfactory confirmation of, the effects from independent laboratories. Those who favor the hypothesis that local destructive tissue change precedes calcification point to the frequency with which the disease is associated with scleroderma. In scleroderma hyaline changes occur in the subcutaneous tissues. However, in some 60 per cent of cases in Steinitz's series the patients did not have associated scleroderma, and recent histologic studies by Bauer, Marble and Bennett [11] have not confirmed the presence of preexisting necrosis of tissue in regions in which calcium has been deposited. The search for an explanation must continue.

REPORT OF CASES

CASE 1.—A woman aged 51 came to the Mayo Clinic complaining of pain and stiffness of the joints. Her medical history was irrelevant excepting that she had never menstruated and had experienced no pregnancies.

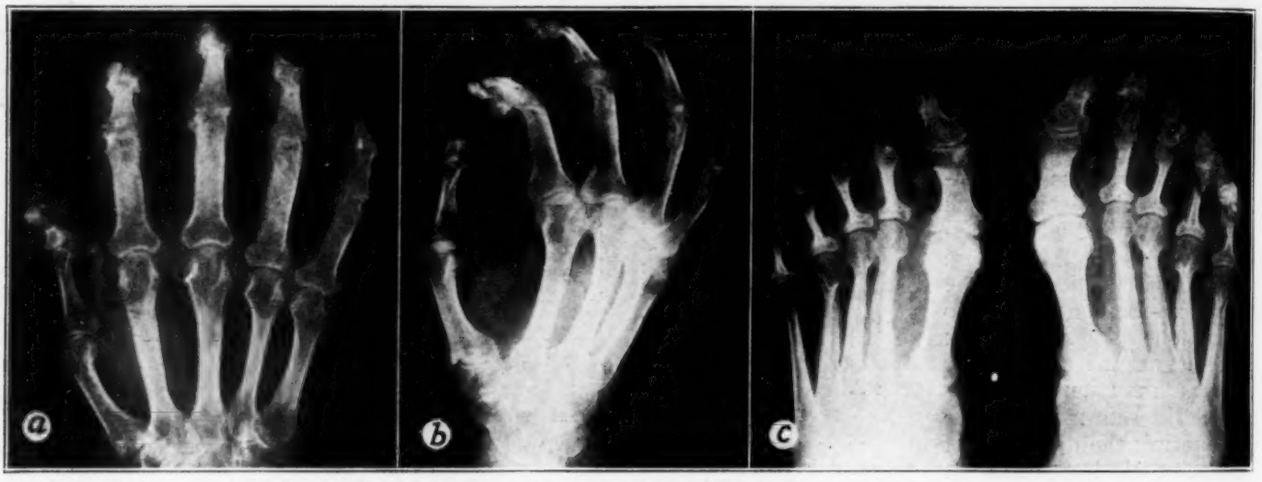

Fig. 2 (case 1).—Deposits of chalk-like material are visible about the phalanges of the fingers and toes. Several terminal interphalangeal joints in the hands have been markedly destroyed by an arthritic process, and similar hypertrophic changes are seen about the midinterphalangeal joints: *a*, anteroposterior view of right hand; *b*, lateral view; *c*, view of feet to show toes.

Four years before her visit to the clinic she had noted the gradual onset of dull aching pain in the tips of the toes. Within a few months walking became difficult because of her painful feet. Her knees also became painful. A year after the onset of the disease, the finger tips became painful, especially on attempts to grip, as in turning a doorknob. Within another year, aching and stiffness had extended to elbows and shoulders. The stiffness was particularly marked after inactivity. The patient often attracted considerable attention when she was leaving a theater, because of stiffness and difficulty in straightening to the erect position.

For two years she had noted attacks of pain in the finger tips associated with changes in color from white to bluish red. These occurred when she was exposed to cold. She had obtained relief from these attacks by immersing the hands in warm water.

Results of the physical examination were essentially negative excepting for the extremities. There was limitation of ability to abduct the right shoulder graded 2 (on the basis of 1 to 4). The forearms could be extended only to 175 degrees because of slight contractures in flexion at the elbow joints. There was limitation of motion at the joints of the fingers so that she was unable to close the fists tightly. The fingers were diffusely

10. Costello, M. J.: Cutaneous Calcinosis, New York State J. Med. **35**: 1266-1271 (Dec. 15) 1935.

11. Bauer, Walter; Marble, Alexander, and Bennett, G. A.: Further Studies in a Case of Calcification of Subcutaneous Tissue ("Calcinosis Universalis") in a Child, Am. J. M. Sc. **182**: 237-251 (Aug.) 1931.

thickened, but no spindle-like enlargement of knuckles was noted. The regions of the terminal phalanges of all the fingers were tender to pressure and the overlying skin was indurated, dry and scaly. On the dorsal aspect of several fingers small subcutaneous nodules could be seen and felt; they were from 2 to 3 mm. in diameter. The skin over some of these nodules appeared to be scarred (fig. 1). In these regions ulceration, discharge of nodules and subsequent healing had occurred. Eight or ten similar nodules could be seen shining through the skin of the lateral aspect of the left elbow, and similar small deposits were present about the anterior aspects of the knees. Both ankles were swollen graded 1+ but were not tender, and the subastragaloid regions were markedly limited in range of motion.

Blood counts and examinations of the urine gave essentially negative results. The value for blood calcium was 9.6 mg. per hundred cubic centimeters and for phosphorus 3.4 mg. per hundred cubic centimeters. The value for serum phosphatase was 1.7 units. Roentgenograms of the right hand (fig. 2 *a* and *b*) showed extensive destructive changes caused by arthritis, involving the terminal and middle phalangeal joints with heavy deposits of calcium in the subcutaneous tissues of the terminal phalangeal portions and destruction of the adjacent bone of the terminal phalanx. In the roentgenograms of the feet (fig. 2 *c*) there was noted marked periostitis of the shafts of the second, third and fourth metatarsal bones bilaterally and evidence of inflammatory and destructive changes in joints involving the tarsal joints. Deposits of calcium were seen about the phalanges of the toes similar to the deposits noted in the hands. A curious portion of subperiosteal rarefaction was noted in the roentgenogram of the left elbow at the site of the two regions of subcutaneous deposition of calcium along the outer aspect of the humerus. Portions of subcutaneous calcification were also noted about the lower aspect of the right knee.

Examination of the capillaries of the nail folds was carried out according to the technic of Lombard.[12] They were very difficult to see because of the deformities of the fingers. However, it was noted that the number of loops was decreased in each field. The individual loops were large, were irregular in shape, and appeared to have marked loss of tone, resembling the capillaries frequently observed in the presence of scleroderma. No results of treatment can be reported at this time.

CASE 2.—A man aged 45 when he came to the Mayo Clinic in 1928 complained chiefly of stiffness and soreness of the hands, feet, knees and elbows, with dryness and cracking of the skin of the hands. He had been very active in athletics, having participated in football, baseball, track and basketball, thus having been exposed to numerous traumas for many years. The history of the present illness was as follows: Shortly after his enlistment in the army in 1918 he had noticed a stiffness of the hands, with soreness of the joints and a dryness and cracking of the skin of the fingers. To close the hands was painful. He could not play baseball because it caused pain in the hands. Two or three months later he had noticed soreness and stiffness of the joints of the feet and knees. His joints limbered up with exercise. A year which he spent in New Mexico for a change in climate did not help. Alveolectomy and tonsillectomy had been done with no improvement.

During the year before the patient's visit to the clinic, small lumps had appeared in the ends of the fingers, and he said that the tips of the fingers had seemed to feel sore.

He had noted some difficulty in regulation of the temperature in the feet and hands; at times the feet were very cold and could be warmed only with great difficulty, and at times he awakened in the morning with very warm hands, which assumed a normal temperature only after exercise. His hands easily turned blue with chilling.

Fig. 3 (case 2).—The skin over the terminal portions of the fingers is cracked, and numerous scars are visible over the region of the terminal interphalangeal joints, where ulceration and discharge of chalk deposits have taken place.

On physical examination the patient was found to be well developed and well nourished. The skin covering the hands was very dry; this was most marked over the dorsal portions of the fingers and especially over the terminal phalangeal joints (fig. 3), where the skin was hard, fissured, shiny and red. The same appearance was noted in the skin overlying the proximal portions of the fingers. The skin over the metacarpophalangeal joints also was dry, shiny and tight. On the end of the thumb and index finger of the right hand and of the thumb, index finger and fourth digit of the left hand, small hard nodules could be felt under the skin. The patient was unable to close his hands completely. The skin over the elbows was dry and somewhat scaly. The skin over the toes was shiny and red but the changes in the skin in this region were less marked than those in the fingers. The skin over the knees was somewhat tight and shiny. Multiple ricelike bodies were noted in the scalp along the upper border of the forehead.

The appearance of the skin was not exactly that presented by scleroderma or Raynaud's disease, although these conditions were simulated by some features of the patient's condition. The cyanosis of the fingers, the trophic changes that have occurred in the skin and the deposits of calcium suggested a vascular disease of the skin.

12. Lombard, W. P.: The Blood Pressure in the Arterioles, Capillaries and Small Veins of the Human Skin, Am. J. Physiol. **29:** 335-362 (Jan.) 1912.

Routine examination of the urine and the blood counts yielded essentially negative results. The value for serum calcium was 10.2 mg. on one occasion and 9.3 mg. on another determination. Diffusible calcium was 5.0 mg. and nondiffusible calcium was 4.3 mg. The concentration of uric acid in the blood was 3.6 mg. per hundred cubic centimeters.

Roentgenograms of the hands showed slight evidence of hypertrophic arthritis involving the terminal phalangeal joints. Heavy deposits of calcium were seen about the terminal phalanges of the first, second and fourth digits of both hands. The bones did not appear to be diseased on the left side. In the right hand (fig. 4), however, the calcium appeared to have been deposited near regions wherein the bone of the phalanx had been eroded.

PROGNOSIS

Very little information is available regarding the ultimate fate of persons who have this disease. Death has been reported as having been caused by "circulatory weakness," cancer of the stomach, pulmonary tuberculosis, uremia, and asphyxia resulting from obstruction by a bolus of food. Thus the disease in itself is not fatal but death results from intercurrent illness.

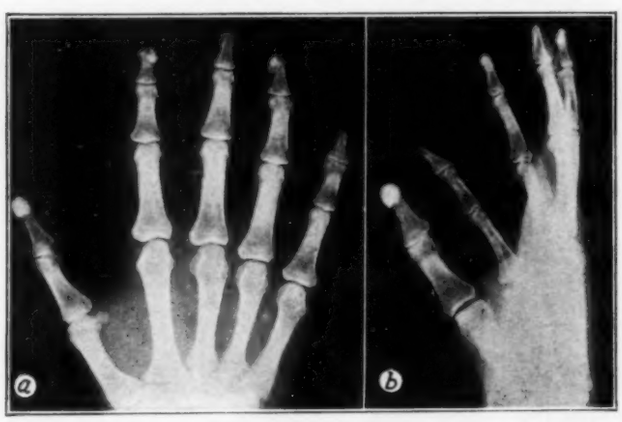

Fig. 4 (case 2).—a, anteroposterior view of right hand; b, lateral view. Heavy deposits of chalk may be seen about the terminal phalangeal regions. The bone has apparently been eroded adjoining some of the deposits. Hypertrophic arthritis (possibly unrelated) may be noted in the terminal interphalangeal joint of the right fifth finger.

TREATMENT

Many treatments have been tried for patients suffering from this disease. Some reputedly have been successful. Surgeons have operated to remove the autonomic nerve supply to blood vessels, to remove the thyroid gland, the parathyroid glands and often to excise the nodules of chalk. Extracts containing the hormones of the pancreas, pituitary body, ovary, parathyroid glands and thyroid glands have been administered. Iodides, phosphates, acetylcholine and other drugs have been tried. Heliotherapy, roentgen therapy, electrophoresis and a lemon diet have been recommended. More recent reports have dealt with interesting attempts to treat this disease by applying newer methods of mobilizing calcium. Craig and Lyall [13] administered disodium hydrogen phosphate in the attempt to cause interference with the normal absorption of calcium, the expectation being that the bones subsequently would draw on calcium from the deposits of chalk. Kennedy [14] has had success with the use of a ketogenic diet. Ammonium chloride, sodium citrate and parathyroid extract have been used. Some patients have recovered without treatment.

13. Craig, John, and Lyall, Alexander: A Case of Calcinosis Universalis, and Suggested Method of Treatment, Brit. J. Child. Dis. **28:** 29-34 (Jan.-March) 1931.

14. Kennedy, R. L. J.: Calcinosis and Scleroderma: Treatment of a Case by Use of the Ketogenic Diet, J. Pediat. **1:** 667-673 (Dec.) 1932.

Clinical Notes, Suggestions and New Instruments

A CASE OF TRICHINOSIS PRESENTING CHEMOSIS OF THE BULBAR CONJUNCTIVA

LOUIS LEHRFELD, M.D., AND CARL F. BREISACHER, M.D.
PHILADELPHIA

Bulbar chemosis, alone or with other symptoms, is not generally considered to be a symptom of trichinosis. Osler [1] considers edema of the eyelids a characteristic symptom but does not call attention to bulbar chemosis in this disease. Foster Moore [2] makes no mention of it, and it is not described in standard ophthalmologic textbooks.[3] There are, however, several references to this symptom in the ophthalmic literature and also in the general medical journals. Parker [4] in 1907 reported six cases, four of which presented lid and conjunctival edema as the chief complaint. Carter [5] in 1930 reported three cases and called particular attention to bulbar chemosis as a prominent symptom. Stoll [6] in 1929 presented two cases in both of which chemosis was the chief complaint. Hickling,[7] Thomas and Cooper [8] and Key [9] have also made mention of this symptom.

REPORT OF CASE

C. F., a white female, first came to the emergency room of the Wills Hospital on April 29, 1940, complaining of swelling of the eyes. She gave a rather indefinite history of slight puffiness of the lids of both eyes with swelling of the "whites of the eyes" beginning about one week prior to admission. The swelling of the lid became less but the swelling of the "white portion" increased, with tearing. A feeling of feverishness and malaise accompanied the ocular symptoms.

On examination, the eyelids of both eyes presented slight swelling, both upper and lower. There was no edema of the face or forehead. The conjunctiva of each eye, particularly the lower bulbar conjunctiva, was intensely chemotic, so marked that it protruded between the lids, preventing complete closure of the latter. The conjunctival vessels were slightly injected and the entire conjunctiva had a yellowish, waxy appearance. Both corners were clear, the irises were normal and the pupils reacted normally. The fundus was normal and healthy bilaterally.

The disease trichinosis was suspected and the patient was referred for a complete blood count the following day. This showed a white cell count of 10,800, of which 53 per cent were neutrophils, 25 per cent eosinophils, 17 per cent small lymphocytes and 5 per cent monocytes. Because of the eosinophilia, the patient was admitted to the Wills Hospital the same day, April 30, for further study.

On admission, the temperature was normal, rose to 99.8 F. the third day, May 2, and continued irregularly thereafter, rising to 105 F. on May 6, thereafter gradually falling. After May 9, until discharge May 17, the fever never rose to above 100 F. and was intermittent. The respiratory rate varied from 18 to 28 a minute, the pulse rate from 88 to 112.

Results of the blood counts are given in the accompanying table.

From the service of Dr. Louis Lehrfeld, Wills Hospital.

1. Osler, William: Principles and Practice of Medicine, ed. 11, revised by McCrae, Thomas, New York, D. Appleton & Co., 1931.

2. Moore, R. F.: Medical Ophthalmology, ed. 2, London, Churchill Company, 1935.

3. Duke-Elder, W. S.: Text Book of Ophthalmology, St. Louis, C. V. Mosby Company, 1938, vol. 2. Berens, Conrad: The Eye and Its Diseases, Philadelphia, W. B. Saunders Company, 1936. Fuchs, Ernst: Diseases of the Eye, ed. 10 (English), (translated by W. Duane), Philadelphia, J. B. Lippincott Company, 1933.

4. Parker, F. J.: Eye Symptoms of Trichinosis, M. Rec. **72:** 179, 1907.

5. Carter, L. F.: Trichinosis and Its Ocular Manifestations, Tr. Sect. Ophth., A. M. A., 1930, pp. 72-82.

6. Stoll, H. F.: Trichinosis: Two Cases Presenting Diplopia and One, Polyserositis, J. A. M. A. **92:** 791-793 (March 9) 1929.

7. Hickling, R. A.: Edema Around the Eyes Caused by Trichinella Spiralis, Brit. M. J. **2:** 654 (Oct. 10) 1931.

8. Thomas, J. B., and Cooper, W.: Case, Trichinosis with Predominant Symptoms Referable to Eyes and Frontal Sinuses, Am. J. Ophth. **7:** 511-512 (July) 1924.

9. Key, B. W.: Trichinosis: Case with Exophthalmos, Tr. Am. Ophth. Soc. **26:** 87-97, 1928.

Laboratory examinations were made; the urine was normal and the Wassermann reaction negative. Dental and rhinologic consultants returned negative reports. The stool was examined but no parasites or ova were found. On May 6 (seven days after admission) a small section of the gastrocnemius muscle was excised, sectioned, stained and examined by Dr. J. H. Clark (Philadelphia General Hospital), who found the encysted larvae of Trichinella spiralis.

Dr. C. C. A. Banes, who made a general physical examination, found no signs except the ocular ones already mentioned but concurred in the diagnosis.

Further questioning of the patient produced a dubious history of ingestion of uncooked pork two days before the first symptoms were noted. This was not considered to be the offending material, since the time elapsing between ingestion and the appearance of symptoms was very short.

The clinical course of the disease was extremely mild during hospitalization, there being only mild general malaise in spite of the high fever. The chemosis had disappeared by May 6 (the seventh day after admission), leaving only a slight bulbar injection. No swelling of any other part was noted until three days prior to discharge, when the left ankle was noted to be slightly puffy. This had abated on dismissal from the hospital, May 17.

The only treatment consisted in purging with magnesium sulfate every third day (there was no diarrhea at any time), complete rest in bed and a boric acid flush to the eyes several times daily.

In spite of advice to the contrary, the patient signed her release on May 17 (eighteen days after admission) and when last seen on May 28 was symptom free and apparently in excellent health.

After the patient had been discharged, the sections of gastrocnemius muscle were submitted to Dr. John Bozicevich of the United States Public Health Service for examination.[10] In his opinion the well developed cysts enclosing third stage larvae of Trichinella spiralis were indicative of an old infestation, but it was considered that, from the clinical features of the case, there had been a recent superimposed infestation.

Results of Blood Counts

Date	Hemoglobin	Red Blood Cells	White Blood Cells	Neutrophils	Eosinophils	Basophils	Lymphocytes	Monocytes
April 29....	82%	4,930,000	10,800	53%	25%	0	17%	5%
May 2.....	82%	4,190,000	10,000	45%	26%	1%	27%	1%
May 3.....	....	.....	12,800	42%	28%	0	24%	6%
May 9.....	80%	4,050,000	12,300	45%	20%	0	33%	2%
May 14.....	77%	4,430,000	11,500	38%	15%	0	43%	4%
May 17.....	80%	4,500,000	11,800	26%	25%	0	41%	8%

COMMENT

No specific treatment for trichinosis is available. In recent years the use of neoarsphenamine intravenously has been advocated but with varying and questionable results. It was not considered advisable in this case, since it was not one of severe involvement.

The peculiar waxy or yellow jelly-like appearance of the bulbar conjunctiva seen in this case was also observed by Carter.[5] Herrenschwand[11] in 1927 was privileged to study an eye involved by trichinae at autopsy. According to his observations the bulbar conjunctiva showed marked round cell infiltration with a superabundance of goblet cells. Trichinae were present in the ocular muscles, mainly in the belly of the muscle and not near the tendinous attachment. They were present in greater numbers than in the skeletal muscles.

It has been considered that edema of the conjunctiva and lids is concomitant with infestation of the rectus muscles with the trichinae. Verhoeff[12] questions this, however, maintaining that chemosis appears before general muscular symptoms develop.

In most of the cases reported, pain on movement of the eyes was present; but the case here reported did not show this feature. Also in other cases the edema was more prominent over the insertions of internal and external rectus muscles with small punctate hemorrhages, but this too was absent in our case.

The fact that chemosis is a frequent and prominent symptom of the disease trichinosis has not been adequately stressed. As mentioned previously, Carter[5] drew attention to this and went so far as to conjecture its presence in 50 per cent of cases. If this is so, it is apparent that many cases are missed by the ophthalmologist. In recent years many writers have reported encysted larvae of Trichinella spiralis in muscles of a relatively large percentage of autopsies. In these cases no history of infestation was secured. Perhaps the ophthalmologist can in the future detect more of these cases. The importance of a blood count in any case of conjunctival edema presenting a waxy yellow appearance, and without apparent cause, cannot be overemphasized. Certainly the disease should be kept in mind and not considered remote from the practice of ophthalmology.

Sixteenth and Spring Garden streets.

10. Bozicevich, John: Personal communication to the authors.
11. Herrenschwand, F.: Eyeball as a Path of Invasion in Human Trichinosis, Arch. f. Ophth. **119**: 374-385, 1927.
12. Verhoeff, F. H., in discussion on Carter.[5]

Special Clinical Article

RECENT DEVELOPMENTS IN THE SURGICAL MANAGEMENT OF THE OBSTRUCTING PROSTATE

CLINICAL LECTURE AT NEW YORK SESSION

JOSEPH FRANCIS McCARTHY, M.D.
NEW YORK

The extraordinary advance of medicine in the surgical specialties is nowhere better illustrated than in the field of prostatic surgery. The past ten years has seen unfolded revolutionary instrumental methods of correction of obstructing prostatism. Naturally this departure from formerly accepted principles has occasioned much discussion, some of which has been constructive. That it has, however, successfully withstood the acid test of time is indicated by the general acceptance on the part of the profession of the method as such after a ten year period of trial and error. Another constructive effect of the many communications on the subject, with their attendant discussions, has been to occasion a reevaluation of the formerly accepted methods of open surgical approach. This state of mind has been and will continue to be the occasion of further progress in technic as well as in other factors. I am well aware of the advanced position assumed by some of my colleagues that instrumental operations have practically replaced open surgery. Since, however, I regard this as a period of evolution, a word of caution is offered against the general acceptance of this point of view.

Psychologic limitations have never been so apparent as in the writings of some of the commentators on the surgery of the prostate gland. Their theses have been in large measure a reflection of personal predilections, aptitude, precepts of their predecessors or environmental influences. If these premises are even in part acceptable, it logically follows that one who presumes to speak or write with even measurable authority should, however he concludes it, begin at least his dissertation in an atmosphere of detachment. The other thought that at once arises which is somewhat removed from the particular subject and perhaps

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a bit academic but which "sticks out like a sore thumb" is the altogether obvious limitations, professionally speaking, of the young medical man who begins and concludes his institutional medical education under the egis of one educational center.

The romance of the prostate, surgically speaking, is the story of continued progress in technical procedure, improved methods, lowered mortality, briefer hospital domicile, lessened morbidity. When it is realized that these advances vitally affect 25 per cent of male mankind, in other words one fourth of the matured minds and bodies of the male portion of the nation, all concerned in this tremendously constructive piece of sociological endeavor merit the comforting feeling of a job well done. Far from considering the job as finished, however, this situation should be regarded as merely a point of departure to other and greater advances. The complacent will, as always, "miss the boat." With this prelude, let us consider the probable routes of further progression.

One of the great forward steps in suprapubic prostatectomy was the inauguration by Lilienthal of the two step operation. This was a veritable life saving innovation. But "time marches on" and the question arises whether, with the marked progress in technical equipment, there may not be a general reversion to the one step operation. There are two well grounded reasons for interposing this question. First, we have ample clinical experience to justify the belief that the vertical incision for cystotomy, so commonly employed in this country, should, save in exceptional instances, be abandoned. It has nothing to commend it except precedent. It has played a not unimportant role in the high mortality of the past. For the benefit of those who may not have read my prior description, the approach is herewith appended:

A transverse incision 5 cm. in length, 5 cm. above the middle of the symphysis includes the superficial tissues and the muscle sheath. One then separates the muscle longitudinally and the parts are retracted. Prior to incision, the bladder has been filled to two thirds capacity and a catheter is left remaining with loaded syringe attached. At this point the bladder is palpated so that one senses the further expanding organ as the additional fluid is introduced. The operator with sharp dissection then exposes the bladder wall, which is seized with Allis clamps above and below the point where the transverse cut is to be made. It should be emphasized that a transverse incision in the bladder is at once more satisfactory from the standpoint of approach and heals much more kindly than does the vertical. The major steps from this point on apply to either one or two stage removal of the gland. In the two stage, a suitable tube is then introduced through the opening. I employ a fair size mushroom catheter, preferably the angulated type. Then a circular suture is taken and closed snugly about the tube as the mushroom part is brought up against the bladder wall. The sutures are not cut, as they are intended later to be used for traction on the bladder to obliterate spaces for possible infection. The ends of the suture about the tube are then passed through the incised rectus sheath, one above and one below the transverse incision, and when drawn on later and tied, brings the bladder wall close to the abdominal wall. A small piece of rubber dam is introduced and the incision in the sheath closed by No. 3 or 4 chromic gut sutures. Final closure may be made by two or three figure of eight tension sutures.

TREATMENT OF PROSTATIC BED AFTER ENUCLEATION

There has been a gradual change in treatment of this bleeding surface. For many years we remained, as Robert T. Morris facetiously described it, in the era of taxidermy—we stuffed our patients with gauze. Then came the compression bags of Hagner, Pilcher and others; next suture of the cut edges. Later, Harris effected in most of his cases almost complete hemostasis by deep suture. For one or a number of reasons, none of these methods of arrestation have proved so generally acceptable as to rule out the others. It is my hope that the method to be described may prove acceptable, after sufficient trial by others suitably equipped. After suprapubic enucleation of the gland, the cavity is somewhat firmly packed with a long 2 inch gauze roll taken from water at a temperature just about as high as the fingers of the operator can support. Bimanual compression supplements this for a few minutes and the gauze is then removed. Prior to enucleation the patient has been prepared as for a cystoscopy. The visualized electrotome is now introduced through the urethra; suction is begun at the site of the incision as the flow of water through the endoscope is started. One is surprised at the clarity of vision and the precision with which bleeding points can be seen and coagulated with the gap current. Where satisfactory hemostasis is accomplished, the use of packing or the compression bag is unnecessary. When it fails nothing is lost, as the other measures are still available. Finally, it obviates extensive tissue separation should one desire to suture or clamp from above. If the endoscopic method of arrestation of bleeding with the visualized electrotome as here described proves effective on further trial by others as well as by myself, it may obviate the blind and, it may be said, unsurgical method of packing or bag compression in general use today.

My objective in this tentative proposal is to obtain an early decision from a group of qualified workers in this field. Should time and usage prove these technical steps acceptable, it will perhaps be conceded that the important factors which militated against the one stage suprapubic prostatectomy may thus be eliminated. These factors may be summarized as follows: prevesical or perivesical infection; secondary bleeding shortly postoperative, or later bleeding incidental to removal of compression apparatus; discomfort of the patient.

For purpose of clarification my point of view is that infection has been reduced to a minimum by the transverse approach as previously described, the constitutional reaction strikingly lessened and healing hastened. Here the clinical background in the method is sufficient to warrant the assumption that with certain selective exceptions the now generally used vertical incision for suprapubic approach will be abandoned and a reconsideration of the necessity for the two stage operation would appear to be in order.

PERINEAL APPROACH

I have never been completely convinced that most of the technical methods of perineal prostatectomy found in textbooks and monographs have been based on sound anatomic or physiologic principles. With this general assumption, it is in order to particularize. First, the practice of many years of an incision over each of the prominent lateral lobes and the piecemeal removal of such lobes is certainly an error. It is merely a replica of the method of Freyer in suprapubic removal, a method long since abandoned for good and proper reasons. Intra-urethral enucleation is the one rational

method of surgical removal of the prostate, either from above or from below. Thus one conserves the internal sphincter. This may be easily proved by subsequent cystographic study. Then too the impression of the technical difficulties of the operation have been overstressed. The following technic offers a rational and easy method:

The first arm of the incision is transverse, and each terminal of this incision is extended by an additional one downward and outward to the tuberosity of the ischium. These incisions are deepened and the ischiorectal fossa on each side sufficiently dilated to outline the central tendon. The finger of the left hand is then introduced into the rectum and, with appropriate retraction, the last mentioned structure and the rectourethralis muscle are cut sharply and separated bluntly until the bifurcation of the levator ani muscles is reached. A bougie or a Foley catheter bag on which traction may be exerted, which has previously been passed through the urethra, is now palpated as a guide to its position. From the perineum to this point the anterior wall of the rectum takes a direction upward toward the urethra. It is essential therefore for the occasional operator, and wise for the expert, to give himself the benefit of the palpating finger in the rectum up to this point in the operation. From here on, however, one has to deal in large measure with areolar connective tissue and with a descending anterior rectal wall, which can be separated by blunt dissection up to the fascia of Denonvilliers. Consequently the palpating finger is now withdrawn, new gloves are applied and the dissection is proceeded with as in any surgically clean operation. When the fascia covering the prostate has been incised, also transversely, the prostate is exposed and a transverse incision is made into the prostatic urethra posterior to the verumontanum. The Foley bag is now removed, a firm rubber bag retractor is introduced into the bladder (Parker Syms type), the prostate brought into the field and the gland removed (intra-urethrally) usually in one piece. From this point on, whatever procedure one elects may be carried out. Only essential details are herein described.

COMMENTARY

I believe (a recently acquired view) that elaborate dissection of the ischiorectal fossae is unnecessary, that when carried out it prolongs wound healing and adds to the danger of infection. The model of bladder retractor here submitted and which has rested in the archives for many years is a frank copy of the Parker Syms retractor. In the opinion of those of us who have seen it in operation it is completely satisfactory. As a matter of fact, Parker Syms, with his three minute prostatectomy of fifteen or twenty years back, had at least some of the essentials of a perfect perineal prostatectomy. He made the usual vertical incision in the perineum such as was used for an external urethrotomy, cut down on a staff in the urethra, introduced his bag and, under traction, enucleated the prostate. The cardinal failure here was his complete indifference to the external sphincter.

The approach described obviates the defects just reviewed. Moreover, in a perineal prostatectomy based on sound anatomic and physiologic consideration there should be no excuse for damage to either sphincters or rectum. The foregoing details on technic are submitted merely as an expression of my present opinion as to the probable lines along which further progress may be achieved. They are presented also as an indication that I am convinced we are still in a period of evolution; that, unless and until one or another method has definitely established its superiority in average hands, other methods of proved value should not be altogether abandoned. They must be subjected, however, to sustained and critical scrutiny, as the present accepted methods are by no means perfect. Obviously, complacent acceptance has no place in investigative endeavors.

ENDOSCOPIC PROSTATIC RESECTION

The innovation of recent years of endoscopic prostatic resection has successfully withstood an unprecedented avalanche of dogmatic assertion, contentious debate and premature conclusions. Many of the early accidents, the mortalities inherent in a highly technical method, could have been avoided by a more conservative, a more deliberate, approach, a better apprenticeship. The literature is replete with proof of this statement. The late statistics of those with large clinical background reveal gratifying figures on functional result, mortality, morbidity and hospital domicile. In increasing measure throughout the world, the method that I have advocated, with concurrent improvements, is gradually replacing open operations. In some responsible clinics it has practically replaced open surgery. In our clinic, during the early stages of enthusiasm, open surgery was reduced to a minimum; then came a period of resumption of older methods in a moderate percentage. The third era, the present, finds us performing endoscopic resection in an ever growing percentage of our cases.

The technic remains about the same as described in previous communications. Of course, since the advent of the sulfanilamides, we have lost our fear of infection. Operative time is greatly shortened, as the removal of the tissue is done without interruption, to remove the pieces. These are later evacuated by means of an aspiration syringe designed for the purpose. Then too, with more efficient appliances for the after-care and improved cutting and coagulating apparatus, postoperative complications are rare indeed. The one complication that has harassed the method is its appeal to the inexperienced or the audacious. The thing appears simple when performed by the experienced. What the observer fails to note is the necessity for much prior apprenticeship with the panendoscope and an exact knowledge of conformation of these structures in the normal, without which the extent of pathologic departures and factors of safety cannot be correctly interpreted. Adequate and especially trained personnel for postoperative care are equally necessary.

COLLATERAL TOPICS

Transfusion.—This subject is introduced here merely to give expression to a personal point of view. The clotting time, hemoglobin and red cell count, blood grouping and so on should of course be matters of routine, as preoperative preparedness is an important part of the postoperative management. It may be added that a red cell and hemoglobin estimation immediately following operation is also of value. When and if a transfusion is indicated, I believe that fractional transfusion of citrated blood serves the purpose quite as satisfactorily as direct transfusion of whole blood; moreover, it obviates some of the disadvantages of the latter. There is an absence of the psychic manifestations attendant on direct transfusion. It should always be remembered that we frequently are dealing with the arteriosclerotic, the myocarditic type of patient. That when direct transfusion is employed there is a natural

tendency to give larger amounts than with the citrate method, in which small amounts can be administered in the patient's room repeatedly when necessary and the febrile reaction is not so pronounced. It is now some years since I have employed direct transfusion.

Pharmacology.—A very interesting experience was noted with sulfapyridine, in a resection case in which there occurred a secondary bleeding of sufficient importance to send the patient to the cystoscopic room for aspiration of clots and endoscopic coagulation of bleeding points. A hemoglobin and red cell estimation was made at this time, 4,800,000 red cells and 90 per cent hemoglobin. On the same evening one of the interns thought the patient was developing a bronchopneumonia and administered sulfapyridine. Forty-eight hours later, without any additional bleeding, the hemoglobin was 48 per cent, red cells 2,400,000. The drug was immediately discontinued, yet the further drop in hemoglobin and red cell count became so marked as to necessitate fractional transfusion. Caution, therefore, and repeated blood study should be the watchwords with this group. I have, with few exceptions, restricted my patients to small doses of drugs of the sulfonamide group as urinary antiseptics, from 20 to 30 grains (1.3 to 2 Gm.) daily. Generally satisfactory, occasionally it does not work out, when resort is had to more specific study and other methods. Ritter reports a case of bilateral kidney abscess, in one of the public hospitals, wherein the temperature remained low for most of the two months period of intermittent administration of one of the drugs of the group mentioned. At autopsy there were found discrete abscesses of the kidneys together with crystals of the drug in the kidney tissue.

There is also too much empiricism manifested in the matter of administration of proprietary hypnotics, too little scrutiny of or inquiry into the question of possible idiosyncrasies, too little reliance on the pharmacopeia and too much on the drug house man. Paraldehyde in oil, for example, administered by rectal tube in divided doses, while not to be recommended for kissing the baby after administration, is one of the safest and best of all drugs for sedation or as an aid in block anesthesia.

Anesthesia.—Inhalation or general anesthesia is very rarely employed in our work. For brief cystoscopic operative manipulations, intravenous anesthesia is occasionally used. It must be remembered that the margin of safety here is low. One in 100 administrations of a drug customarily employed was followed by a temporary state of coma and the patient was aroused only to fall again into a comatose condition which lasted through three, for us, very anxious days. Fortunately, the condition cleared up without further untoward end result. Inhalation anesthesia in the ordinary urologic operations is merely a labor saving device for the over busy or impatient individual.

Spinal Anesthesia.—This of course is largely a one man job. When it is administered by a variety of interns, things are apt to happen from time to time. For the average prostatic resection or a not too prolonged bladder operation, 50 mg. of one or another of the procaine hydrochloride group will prove both safe and satisfactory when not contraindicated. My technic is to diffuse the drug with the spinal fluid. It has however been noted that when the spinal fluid seems to be under pressure the anesthetic effect is not as prolonged from this amount of drug as under normal conditions. Immediately after the spinal is administered, an intravenous salt solution is begun and the rate of flow regulated in accordance with the blood pressure readings from the other arm. I am disposed to refrain from the use of morphine or its derivatives in conjunction with the barbiturate group as supplemental to spinal anesthesia because of its depressing effect on the vital centers and the possibility of respiratory failure.

Local Anesthesia.—This is considered here only in conjunction with prostatic resection. Others have reported cases conducted under this type of anesthesia,[1] but its potentiality for good has been ignored. There undoubtedly exists a considerable group of debilitated old men, another small group with antecedent history of anginal attacks, and others wherein one is loath to or refuses to administer inhalation or spinal anesthesia. In many such cases, in my opinion, resection may be successfully done in one or more stages under local anesthesia. It may very well be the practice of the future that the earliest manifestations of prostatic obstruction will be subjected to this simple and safe procedure.

The technic that I employ is as follows: Paraldehyde in oil is administered by rectum in divided doses, beginning some hours prior to operation. With the patient on the operating table a long needle is introduced into the perineum and with the guiding finger in the rectum the needle is passed directly into the prostate in the midline and a 1 per cent solution of procaine hydrochloride is injected. The lateral lobes are then similarly injected. Twenty minutes prior to this step a topical anesthetic solution has been injected into the bladder and urethra. When sufficient time has elapsed, the visualized electrotome is introduced. This instrument is now provided with a new attachment —a long needle with a rack and pinion adjustment affording a back and forth movement. The needle is now introduced into the urethra, first in the midline, and the solution injected under the sphincter as far as the mucosa on its postsphincteric aspect and then well into the lateral lobes on each side. The manipulation is so precise that one can at will and under perfect vision infiltrate any part of the prostatic urethra. While it is to be admitted that I am only in the ground breaking phase of this type of anesthesia in prostatic resection, my experience with it encourages in me the belief in its availability in the type of cases mentioned. I cannot escape the feeling that improper selection of anesthesia in operations on debilitated old men is the major factor in mortality.

Calculous Prostate.—This condition occurs with sufficient frequency to warrant the practice of routine x-ray study. It may also simulate malignancy to the palpating finger. Because of the fact that the ordinary suprapubic or perineal prostatectomy is unsatisfactory in this disease there remain but two methods of attack —total excision of the gland by way of the perineum or endoscopic resection. For a long time I have remained skeptical of the effectiveness of the latter method. Recent experience, however, has been so gratifying that it is my belief the method justifies itself and may enjoy a larger role.

Resection and Malignancy.—Attention has been drawn to the fact that a certain proportion of obstructing prostates, let us say 15 per cent, are actually or potentially malignant. It has also been argued that if such is the case why not employ prostatectomy in all

1. Wishard, W. N., Jr.; Hamer, H. G., and Mertz, H. O.: Local Infiltration Anesthesia of the Prostate Preliminary to Resection, J. A. M. A. **102**: 32-35 (Jan. 6) 1934.

such cases by open surgery? This certainly merits full and frank discussion. The first thought that comes to mind is, What has become of the malignant cases in the clinics, wherein the claim is made that only in a considerably smaller percentage of cases has there been any occasion for open surgery? My departmental associates S. E. Kramer and J. S. Ritter have given utterance to some interesting opinions on this question. They report several cases of late carcinomatous manifestations following resection wherein a report of benign hyperplasia was obtained following the usual microscopic examination. I have had one such case. These observers contend that, because of the perhaps more than occasional occurrence of insular prostatic carcinomas in which the usual signs are absent, routine serial study should be made of segregated sections; that the time and expense involved are justified even though but an occasional case of latent malignancy is disclosed when without such scrutinizing study it would not have been so diagnosed. One might also add with a measure of verity that late malignant growths are known to have occurred under similar circumstances following digital enucleation. It should also be remembered that prostatic tissue is not all removed in the usual open prostatectomy. On the credit side of resection it can be said that many patients with relatively early obstruction will submit to resection who would not accept open surgery; that in some at least of these cases, if an orderly painstaking serial study of removed tissue is made, an early malignant growth may be discovered and thereupon subjected to radical surgery. Here is Kramer's and Ritter's recommendation. They advise "that between seventy-five and 150 slides in the larger type of prostate be subjected to careful examination. At the time of operation it is also suggested that the tissue be segregated into five different areas." My counter proposal for purposes of practicality would be three such divisions: the midline area, one lateral lobe and the other lateral lobe. It would seem a reasonable expectation that, under such careful study following every resection, cases of insular or previously overlooked incipient malignant growths would thus come to early positive diagnosis and radical surgery.

Prostatic carcinoma in its earliest stage is a proper subject for radical perineal excision. When, however, they are well defined or extensive, the end result of this type of surgery scarcely justifies the procedure. The problem then is amelioration. Here resection again plays a valuable role. Many such patients may be carried along for a varying period of time in comparative comfort. One such patient comes to mind who, after five years and three resections, still devotes full time to his business pursuits and, to the unsuspecting observer, enjoys seeming good health.

The only supplemental physical agent that I employ in such cases is fractional roentgen therapy, and for several reasons. The pressing one is to obviate late secondary bleeding, a more than occasional observation in malignant conditions. In this connection it has been strikingly effective. Massive doses, however, should be interdicted. The other reason is for the alleviation of pain when present. Here again it is the most durably effective agent. The third is retardation, a term used advisedly as perhaps a bit more accurate than the euphemistic one of arrestation, so frequently enunciated by the proponents of physical therapy in the management of cancer of the genito-urinary tract.

It is evident from the foregoing somewhat sketchy commentary that the prostatic picture of today is far removed from that of a generation or two past, and those over whose heads hang the portentous shadow of approaching senescence may peer in the nebulous future with considerably less apprehension than could their forbears.

2 East Fifty-Fourth Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING CHAPTER, WHICH IS THE SECOND OF A SERIES ON AMPUTATIONS AND ARTIFICIAL LIMBS TO APPEAR IN THIS COLUMN. WHEN COMPLETED, THIS SERIES WILL BE PUBLISHED IN THE FORM OF A HANDBOOK ON AMPUTATIONS. THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION FOR THE COOPERATION OF ITS GROUP OF CONSULTANTS ON ARTIFICIAL LIMBS. THE COUNCIL IS REPRESENTED BY DRS. FRANK D. DICKSON, HARRY E. MOCK, FRANK R. OBER, S. PERRY ROGERS, PAUL STEELE AND PHILIP WILSON, AND THE ASSOCIATION OF LIMB MANUFACTURERS OF AMERICA IS REPRESENTED BY MESSRS. MCCARTHY HANGER SR., W. E. ISLE, JOSEPH A. SPIEVAK, DAVID E. STOLPE AND J. B. KORRADY.

HOWARD A. CARTER, Secretary.

CHAPTER II. GENERAL PRINCIPLES GOVERNING ALL AMPUTATIONS

1. INDICATIONS

There are three general indications for amputations: (1) acute trauma of sufficient severity to prohibit viability of a part of an extremity; (2) disease, including malignant neoplasm, infection which appears incurable locally and which threatens to destroy life, and gangrene due either to diabetes or to local circulatory failure; (3) chronic deformities, congenital or acquired, so disabling that better function can be assured by amputation than by any amount of reconstructive surgery and physical therapy. The type of operation indicated and the degree to which function of the stump may be anticipated are dependent somewhat on the cause for amputation.

A. *Trauma.*—If a part of an extremity is entirely severed or if it is absolutely apparent that it cannot be saved and restored to useful function, amputation should be performed immediately. Within the first six to twelve hours, during which the wounds may be grossly contaminated but the tissues are not infected, a clean operation can be performed at a site of election with a good chance of primary healing and a good functional stump. After this period of grace has expired the purpose of the amputation usually becomes the saving of life and all viable tissues rather than the creation of a permanent stump, and a secondary amputation is usually indicated when the condition of the limb and the patient permit. This late amputation may be carefully planned and should result in a good stump for functional purposes.

B. *Disease.*—The saving of life is frequently a paramount consideration in amputations performed for disease. If the surgeon, however, is fully aware of the types of operation most likely to assure a functional stump at the different levels, a good stump can frequently be secured without prejudicing the first consideration in any way.

C. *Deformities.*—Amputations of useless and seriously disabled extremities are always operations of election. The wishes of the patient can be considered, a thorough study of the possible sites and methods of operation can be made, and the limb-maker can be consulted before the amputation is performed. Every such operation should be clean surgery and every stump created should function well.

2. SURGICAL PRINCIPLES

Certain general surgical principles apply to amputations at any level. The bone must be dealt with in the way best calculated to allow it to withstand pressure without pain. Disarticulation leaves surfaces accustomed to pressure from contiguous bone. In amputations in the continuity of long bones the end is much more likely to withstand pressure if amputation is performed through the cancellous portion near either end than if it is performed through the middle portion where the cortex is thick and the medullary cavity is well defined. Osteoperiosteal procedures such as fusion of the tip of the os calcis to the sawed end of the tibia in the Pirogoff operation and the patella to the cut femur in the Gritti-Stokes operation are very successful if union is obtained, but attempts at similar procedures in the shaft portions of long bones are not recommended. The tendinoplastic procedures in the lower third of the leg and in the condylar region of the femur are extremely successful in providing painless stumps, capable of sustaining outside pressure. For amputations through the middle portions the "aperiosteal" treatment of the bone is strongly recommended. This consists in removing the periosteum for a distance of from one-half to 1 inch, smoothing off all rough edges from the cortex with a file or rasp and curetting out the medullary cavity for a distance of from one-half to 1 inch.

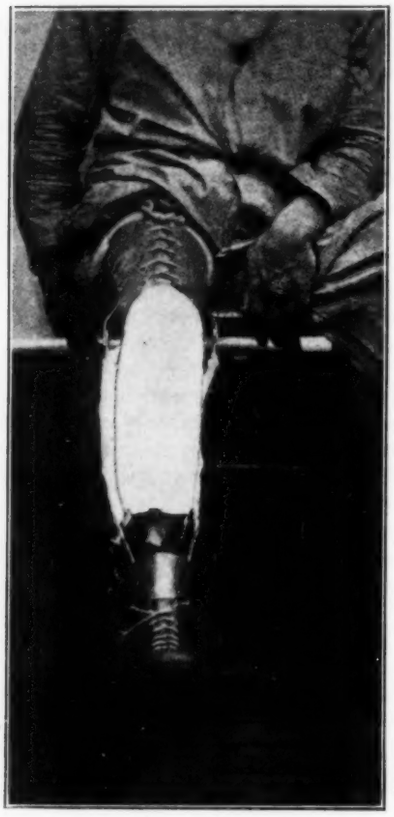

Fig. 1.—Temporary leg with articulated foot and plaster socket for below-knee stump.

Proper treatment of the vessels and nerves is imperative. Major arteries must be isolated and carefully ligated. Opinions differ as to the choice between silk and chromic catgut, but with either material a ligature of large caliber and a measure of restraint in drawing it tight will insure against cutting through the vessel wall. Some surgeons prefer double ligations of major arteries. All important nerves should be injected with alcohol of 95 per cent to absolute strength and cut as high as is practicable without exerting strong tension. Careful injection of alcohol into the terminal portion of the nerve makes plastic procedures on the nerve stump unnecessary. Ligation of major nerves distal to the point of injection is advisable.

The problem of the amount and kind of soft tissues with which to cover the bone ends is important. Muscle tissue used for this purpose and subjected to pressure undergoes atrophy and is converted into scar tissue which is often painful and tender. Broad tendons such as are available behind the lower half of the tibia and in front of the lower fourth of the femur make excellent coverings. Fascia is available everywhere and as covering is second in importance only to skin.

The placement of scars for optimal function of the stump is susceptible to rather definite rules. Plantar flaps provide superior function in amputations of part of the foot and in the osteoplastic and tendinoplastic amputations at the ankle. Anterior flaps are best everywhere between the lower tibia and upper femur. Posterior flaps are preferred when they are available in disarticulation of the hip. In the arm and forearm the end of the stump is subjected to no great amount of pressure, so terminal scars are quite satisfactory. In any situation the bone must be covered with freely movable normal skin with an adequate blood supply and not under tension. For function within a prosthesis, redundancy is as bad as tension. A flabby redundant pad of soft tissues over the end of the bone cannot be fitted well and serves no functional purpose.

3. POSTOPERATIVE CARE

A. *Traction.*—Postoperative skin fixation is advised as a routine procedure. In open amputations skin traction is imperative and should be maintained until healing of the wound is complete. In closed wounds traction is indicated when infection is present or anticipated or when the skin flaps are under considerable tension. Such traction is conveniently applied through wide adhesive straps over a suitable spreader. The many tailed bandage of Scultetus is a convenient and practical outer dressing.

B. *Drainage.*—Surgeons differ on the drainage of amputation wounds. The amount of uncontrolled bleeding and the health of the tissue flaps affect the judgment in each case on this point. If drains are placed, the soft rubber such as is used in making Penrose or cigaret drains is recommended. Precise tailoring of flaps combined with careful hemostasis and closure often renders drainage unnecessary.

C. *Splinting.*—Splinting of the postoperative stump serves two purposes: to restrain painful movements of the stump and to prevent contractures of joints. It also facilitates the application of snug bandaging. It is particularly important in leg amputations, in which the postoperative dressing should include a posterior splint from the upper thigh to a point several inches below the end of the leg stump.

D. *Physical Therapy.*—The amount and kind of physical therapy which may improve the function of an amputation stump depend on the type of amputation which has been performed and on the length of time which for one reason or another is allowed to elapse between the operation and the application of a permanent prosthesis. End bearing stumps may allow function in a permanent prosthesis within so few weeks that little treatment of the stump is needed. Stumps in which function of most of the remaining musculature is preserved will not shrink as much as stumps in which muscle atrophy of disuse is to be anticipated. Regular massage and the continuous wearing of a woven cotton elastic bandage serve to reduce the subcutaneous fat in a stump. Contrast baths, alcohol rubs and hot salt soaks are definitely useful in conditioning the skin and may be used as soon as the wound is healed. Early active motion preserves joint function and muscle tone. Splinting of joints between periods of exercise may be necessary to prevent contracture deformities. Healed

end bearing stumps should be given pressure exercises beginning within two weeks of amputation. In general the purpose is to begin active function, using some form of prosthesis at the earliest possible moment, and to apply such physical measures as may benefit the condition of the stump through the entire period until the patient is thoroughly accustomed to his permanent appliance.

4. THE TEMPORARY PROSTHESIS

Whenever possible the permanent prosthesis for an amputation should be planned and arranged for at the earliest practicable moment. Just as the duties of the surgeon performing an amputation as a life saving measure include the refashioning of the stump at a later date if necessary, so they include supervision of the patient until he has mastered the use of a permanent prosthesis. Unnecessary delay results not only in faulty psychologic adjustment and habits but in joint contracture and atrophy of the stump.

The degree of atrophy inevitable in an amputation stump depends largely on the amount of adipose tissue and functionless muscle tissue left in the stump. Nevertheless, all stumps shrink to a greater or less degree, and thus emerges the dilemma between the recognized advantages of early function and the objection that the original socket will no longer fit after the atrophy has occurred.

One escape from this dilemma is the use of a temporary pylon constructed by the surgeon, consisting of a plaster of paris socket lined with felt, mounted on a sawed off crutch and slung by straps from the shoulders or waist. This contrivance (fig. 1) rids the patient of the crutch habit at an early date, minimizes the contracture and wasting of the extremity from disuse, and reduces the bearing surface of the stump so that a permanent socket can be fitted successfully. It also hastens the inevitable pressure atrophy caused by the use of an artificial limb. It is indicated only for the conical stump which may be inserted and withdrawn through the top of the socket. It does not meet the mechanical problems of alinement, weight bearing and motion, and its use may produce faulty habits difficult to correct after a permanent prosthesis has been fitted.

For below knee amputations a simple type of temporary prosthesis (fig. 2) can be obtained from the limb manufacturers at small cost, which is to be fitted to the patient's stump by means of a plaster of paris socket applied by the surgeon. This prosthesis is equipped with an articulated foot, movable knee joint and a canvas or leather thigh corset. In expert hands such prostheses have frequently been fitted as early as from two to three weeks after amputation.

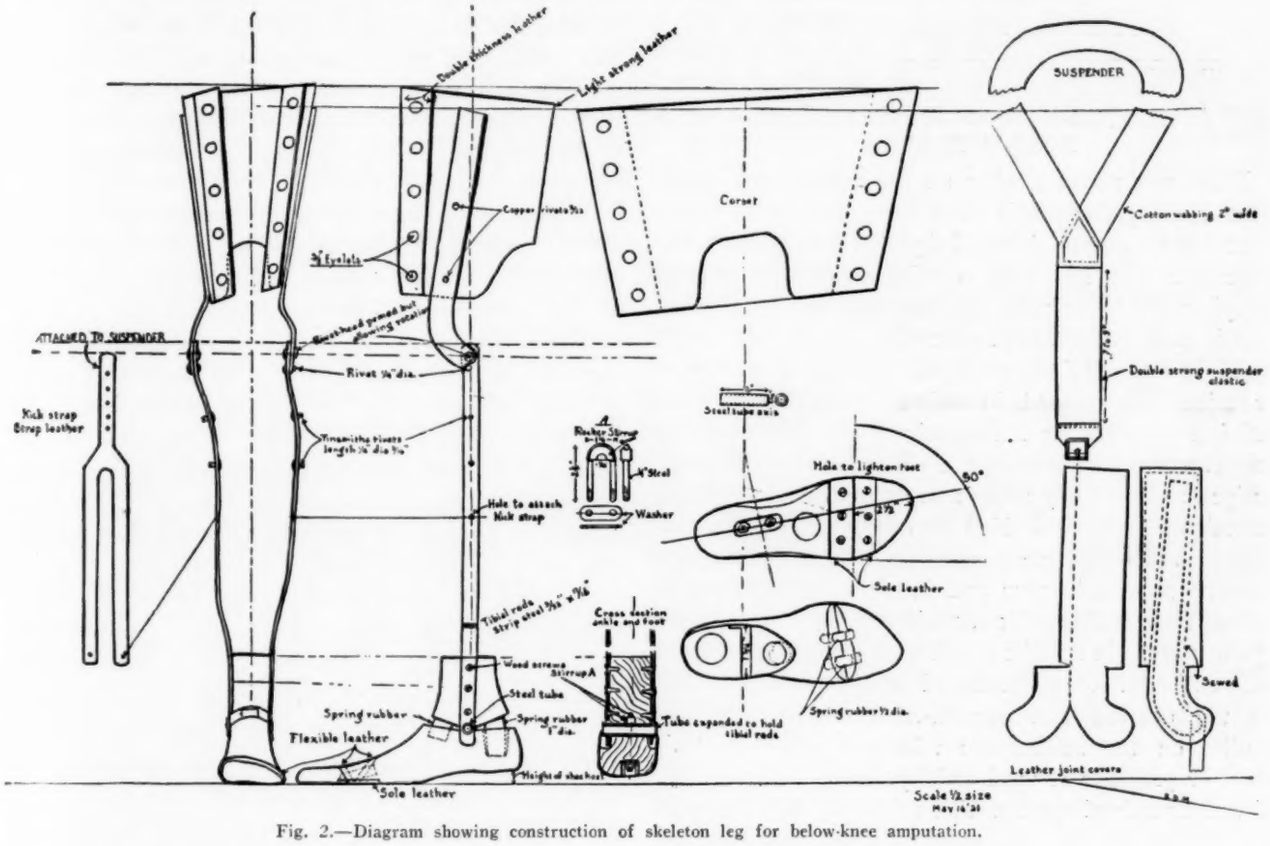

Fig. 2.—Diagram showing construction of skeleton leg for below-knee amputation.

A third alternative is the use of a complete temporary prosthesis fitted by the limb manufacturer. Such an appliance might be expected to meet the requirements of alinement, motion and balance, but to do so makes its cost almost prohibitive. The provision of a temporary appliance at no charge aside from the cost of the permanent prosthesis has been used by some manufacturers as a method of sales promotion not beyond question from the ethical standpoint. A more salutary practice is the fitting of a permanent prosthesis at the earliest possible date, with the provision of a new socket within a few months if that becomes necessary when the inevitable atrophy has occurred. The cost of this method is relatively small.

In any case the prolonged "shrinking" of the stump by tight bandaging over many months is to be condemned. The advantage in permanent fitting is overshadowed by the physical and psychologic evils of disuse.

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SATURDAY, NOVEMBER 23, 1940

IMMUNOLOGIC STUDIES OF POLIOMYELITIS

Numerous recent studies on the immunologic reactions of the poliomyelitis virus have resulted in a considerable extension of knowledge of its behavior. The expensive and somewhat cumbersome procedure of carrying out virus neutralization tests in monkeys to gain information which in most other infectious diseases could be derived from an equal number of test tubes or mice has resulted in efforts to devise a more satisfactory procedure. Recently Raffel and Schultz [1] endeavored to demonstrate a direct reaction between antigen and antibody along more practical lines. Their investigations were divided into four groups: experiments to demonstrate a reaction between virus and immune serums in vivo and in vitro, experiments to demonstrate a changed antigenic specificity of infected monkey cords in reactions with neutralizing serums and with anti-cord serums produced in rabbits, experiments on the obscure Shwartzman-Sanarelli reaction and studies on the heterogenic relationship between the virus or products of viral activity and the erythrocytes of various animal species. The studies involved a series of immunologic methods most of which had not been previously employed but all of which were aimed at eliciting a specific reaction based on an antibody or antigen derived from animals infected with poliomyelitis or convalescent. The technics employed included anaphylaxis in the guinea pig, the use of guinea pig and monkey uterine strips, cutaneous tests in monkeys and precipitative and complement fixation reactions. When the results were added to previous unsuccessful attempts to demonstrate specific precipitin, complement fixation and cutaneous reactions and to those experiments which have eliminated the possibility of the occurrence of a specific soluble antigen during the acute phase of the disease it was obvious that, aside from the neutralization test, the hope for a specific immunologic reaction for poliomyelitis is somewhat remote. Barring therefore the development of some more productive line of research, reliance must continue to be placed on the virus neutralization test in spite of its disadvantages.

Successful adaptation of human poliomyelitis virus to the cotton rat and white mouse is one of the most promising advances in practical research technic of the present decade. Earlier apparently monkeys were the only susceptible animal species until Armstrong [2] reported transference of rhesus poliomyelitis virus to the eastern cotton rat. The disease thus produced in cotton rats was characterized by flaccid paralyses of the extremities associated with degenerative lesions of the anterior horn cells,[3] these lesions being apparently identical with those usually observed in human poliomyelitis and in experimental poliomyelitis in monkeys. The identity of the rodent disease with rhesus poliomyelitis was further indicated by the fact that the rodent infection would produce typical poliomyelitic symptoms and lesions on return inoculation into monkeys.

It was afterward reported by Armstrong [4] that the rhesus virus once serially adapted to the cotton rat could be successfully transferred to white mice. Proof of this transference, however, was incomplete, since it was found that the mouse virus was nonpathogenic on return inoculation into monkeys. This loss of pathogenicity suggested that the human poliomyelitis virus might have been lost, the observed symptoms in mice being due to some unknown neurotropic environmental virus. Such mouse viruses are known to be omnipresent in certain environments and have been recently studied in detail by Theiler [5] and Olitsky.[6]

In order to complete the proof of the successful transference of the human virus to mice, Jungeblut and Sanders [7] have more recently studied the antigenic properties of the passage virus directly isolated from the mouse brain and cord or after propagation in mouse tissue culture. Three successful mouse transferences of the SK New Haven strain of poliomyelitis virus were made by the Columbia University bacteriologists. Confirming earlier investigators, Jungeblut and Sanders found that on serial inoculation into the cotton rat the human virus rapidly lost its pathogenicity for monkeys. Simultaneously with this attenuation for the rhesus monkey there was an increase in rodent pathogenicity. Still further increases were noted in the mouse till a "fixed" virus was eventually obtained, wholly nonpathogenic for monkeys. This fixed virus could be successfully propagated in mouse tissue cultures, embryonic mouse brain in ox serum ultrafiltrate being the most effective culture medium.[8]

1. Raffel, Sidney, and Schultz, E. W.: Immunological Reactions in Poliomyelitis, J. Immunology **39**: 265 (Oct.) 1940.

2. Armstrong, Charles: Pub. Health Rep. **54**: 1719 (Sept. 22) 1939.

3. Lillie, R. D., and Armstrong, Charles: Pub. Health Rep. **55**: 115 (Jan. 19) 1940.

4. Armstrong, Charles: Pub. Health Rep. **54**: 2302 (Dec. 29) 1939.

5. Theiler, Max: J. Exper. Med. **65**: 705 (May) 1937. Theiler, Max, and Gard, Sven, ibid. **72**: 79 (July) 1940.

6. Olitsky, P. K.: J. Exper. Med. **72**: 113 (Aug.) 1940.

7. Jungeblut, Claus W., and Sanders, Murray: Proc. Soc. Exper. Biol & Med. **44**: 375 (June) 1940; J. Exper. Med. **72**: 407 (Oct.) 1940.

8. Sanders, Murray: J. Exper. Med. **71**: 113 (Jan.) 1940. Molloy, Eleanora: Proc. Soc. Exper. Biol. & Med. **44**: 563 (June) 1940.

The immunochemical specificity of the fixed mouse (murine) virus was titrated against numerous specific antiviral serums. Serum-virus mixtures were incubated for ninety minutes at 37 C. and then titrated for unneutralized virus by serial intracerebral inoculations into white mice. Normal human, horse and monkey serums used as controls gave no suggestion of neutralization. Monkey convalescent serum, human convalescent serum and poliomyelitis immune horse serum gave partial or complete neutralization, the highest neutralizing titer being obtained with the pseudoglobulin fraction of homologous poliomyelitis immune horse serum. The serologic data presented by Jungeblut and Sanders leave little doubt that the human virus has been successfully transmitted and adapted to mice, by preliminary serial passage through monkeys and cotton rats.

The most encouraging results, however, have been the claimed successful immunization of monkeys by repeated subcutaneous injections with living mouse virus. This specifically attentuated viable murine vaccine is readily grown in artificial tissue cultures. While the immunity conferred by this viable vaccine is not absolute, it is sufficiently effective to stimulate optimism for further clinical research. If the Jungeblut murine vaccine should eventually prove to be clinically effective, Armstrong's initial observation of 1939 may prove to be one of the major discoveries of modern research medicine.

RHEUMATIC HEART DISEASE IN PHILADELPHIA HOSPITALS

Recently Hedley [1] of the United States Public Health Service reported the results of an extensive survey of cases of rheumatic heart disease in Philadelphia hospitals. This report covered a study of more than 4,600 cases of rheumatic heart disease, rheumatic fever, Sydenham's chorea and subacute bacterial endocarditis in hospitals of this area in the years 1930-1934 inclusive. Hedley's report includes an analysis of the age, race and sex distribution of the conditions mentioned as well as information on their interrelationship.

The importance of rheumatic heart disease as a problem of youth and early adulthood cannot be overemphasized. The onset in 69.1 per cent of the cases of rheumatic heart disease, as well as in 76.4 per cent of rheumatic fever and in 98.2 per cent of chorea, occurred before the age of 20 years. This large scale study shows, furthermore, that the peak of the onset of rheumatic fever, Sydenham's chorea and rheumatic heart disease occurred in the 5 to 9 year age period, the conditions being relatively uncommon in children under 5 years of age. Moreover, the onset of rheumatic fever and rheumatic heart disease in persons over 40 years of age was encountered in only a small percentage of cases. As indicated by Hedley, rheumatic heart disease, unlike some other types of heart disease, is not a problem of great importance among older persons. The data with respect to more than 3,600 cases of rheumatic heart disease would tend to confirm the belief of most investigators that the condition is somewhat more common in females than in males, almost three fifths of the observed cases occurring in the female. This preponderance of cases in females was noted in all age groups except that of 15 to 19 years, in which period the number of cases in the two sexes was about equal. In agreement with most investigators, it was likewise noted that nearly twice as many cases of Sydenham's chorea were encountered in females as in males. About the same number of male and female patients were admitted for rheumatic fever.

About 13 per cent of patients with rheumatic heart disease were Negroes. Although this figure is in proportion to the size of the Negro population of Philadelphia, Hedley suggests that rheumatic heart disease is perhaps less common among Negroes than among white persons; owing to the less favorable economic status of the Negroes (50 per cent of the colored population being on relief) they are more likely to be hospitalized for rheumatic heart disease than are white persons. In any event a more extensive survey would be necessary to elucidate this point.

Observations made on the interrelation of rheumatic heart disease, rheumatic fever and Sydenham's chorea are interesting. Some 61 per cent of the cases of rheumatic heart disease included in the study gave histories of rheumatic fever or exhibited clinical manifestations of the latter condition, while Sydenham's chorea, with or without rheumatic fever, was indicated in slightly more than 15 per cent of the cases. Diagnoses indicated the presence of rheumatic heart disease in 42 per cent of the cases of Sydenham's chorea, and this figure would probably have been larger had the cases been followed after release from the hospital. Anyway these data, together with similar reports in the literature, indicate that the likelihood of developing rheumatic heart disease is much greater for a child with Sydenham's chorea than for one who has never had this condition. Almost 23 per cent of more than 3,600 cases of rheumatic heart disease, including cases complicated by subacute bacterial endocarditis, gave clinical evidence of rheumatic arthritis. More than 80 per cent of the patients under 20 years of age were regarded by Hedley as having active rheumatic infection. This investigator [2] has also pointed out that among persons under 30 years of age more than 75 per cent of the deaths from rheumatic heart disease are apparently attributable to active rheumatic infection.

Hedley's survey is particularly noteworthy because of the large number of cases on which it is based. It is restricted, however, to a single locality and might well be supplemented by similar extensive surveys made elsewhere. Thus the influence of factors peculiar to a restricted area would be as nearly as possible eliminated.

1. Hedley, O. F.: Rheumatic Heart Disease in Philadelphia Hospitals: II. Pub. Health Rep. **55**: 1647 (Sept. 13) 1940.

2. Hedley, O. F.: Rheumatic Heart Disease in Philadelphia Hospitals: III. Pub. Health Rep. **55**: 1707 (Sept. 20) 1940.

PAN AMERICAN HEALTH DAY

For nearly four decades the American republics have cooperated systematically in the prevention of the international spread of disease.[1] During the last two decades this cooperation has been made both more effective and extensive. In order to give this hemispheric relationship a more efficient and stable basis, the Pan American Sanitary Bureau was created in 1902. It is the oldest of the great international health bodies and practically the only one functioning at present.

Authority for the work of the bureau, which has grown from a purely advisory role in quarantine matters to an active interest in many health problems, is contained in the Pan American Sanitary Code adopted in Habana in 1924 and ratified by all the American republics, the first inter-American treaty to enjoy this distinction. During the years of its existence, the bureau has received constantly increasing support and financial assistance from the different republics.

Among the recent cooperative activities undertaken by the bureau [2] have been arrangements for international health conferences and representation at important meetings; health exhibits; organization of technical committees to study such problems as nutrition, malaria and health legislation; granting of scholarships; field work in plague control, poliomyelitis campaign, water supplies, sewage disposal, hospital organization, vital statistics, promotion of cultural relations; collection and dissemination of epidemiologic information; publication of the monthly bulletin and other literature including weekly statistics of disease prevalence; answering inquiries on public health and medical questions; furnishing aid in the case of catastrophes such as earthquakes; translating into Spanish the U. S. Pharmacopeia and allied material; distribution of bacterial cultures and biologic standards. Above all, however, stress has been laid on promotion of international cooperation in health matters and maintenance of relationship with various national health authorities.

In recognition of the success of these decades of inter-American health and medical cooperation, the fourth Pan American Conference of National Directors of Health resolved in May 1940 that Pan American Health Day should be celebrated every year in all the American republics. The date chosen for this purpose, December 2, was, in 1902, the date of the first Pan American Sanitary Conference in Washington. Decrees have already been issued in practically all the American republics proclaiming this day as Pan American Health Day. A similar proclamation is under consideration by the President of the United States, favorable action having been recommended by the Federal Security Administrator, the Secretary of State and the director of the Pan American Sanitary Bureau.

The celebration will have a twofold purpose: first, to commemorate what Pan American cooperation has achieved in health during the last few decades, recalling incidentally those great men who in all the American republics have done so much to promote public health and, second, to center attention on the teaching of preventive principles and practices and to rededicate all hearts to the great cause of public health and Pan Americanism. Elaborate arrangements have been made in practically all the American republics for the celebration of this day on a national scale, through the cooperation of health and educational authorities, national societies, the press, radio and similar agencies. Even outside its public health connections, the medical profession is going to take a leading part in the celebration. The academies of medicine of Colombia, Mexico and Peru are preparing official ceremonies. The plans for celebration in the United States include a radio program on December 2 in which representatives of leading medical and other scientific societies will participate.

Amid the troubles of this distracted world, all the nations in the American hemisphere, from the St. Lawrence River to Cape Horn, will unite in recalling the permanent blessings of peace and health. For this purpose international cooperation and understanding are essential. The physicians of the United States, who have always encouraged this movement for closer scientific relations among the American nations, will be pleased to join again in approval of this activity.

1. The Tenth Pan American Sanitary Conference, editorial, J. A. M. A. **112**: 1258 (April 1) 1939.
2. Annual Report of the Director, Pan American Sanitary Bureau, 1939-1940.

THIRD ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Industrial health is of exceptional interest at this time when national preparedness depends so greatly on industrial production. The attention of physicians is called to the program of the Annual Congress on Industrial Health published in the Organization Section in this issue. This will be the third of these meetings sponsored by the Council on Industrial Health of the American Medical Association. They are designed to acquaint the physician and others with the rapidly expanding importance of preventive medicine and surgery applied to industrial organization.

Since every man hour of production is vital at this time, the program of the congress is intended to be as helpful as possible to physicians called on to control those factors which in the past have contributed greatly to the incidence and costs of industrial absenteeism. In the field of trauma the hand and the eye have proved to be particularly vulnerable. Symposiums have therefore been developed to present the best current opinion on the management of these costly forms of industrial disability. Of the occupational diseases, dermatitis has long been recognized as the most troublesome. A series of demonstrations has been planned to include discussion of the criteria for diagnosis of industrial cutaneous

disorders as well as accepted methods for the treatment and placement of susceptible employees. Among nonoccupational diseases the common cold and influenza annually exact an enormous toll through loss of earning capacity and disruption of production schedules. This problem also will be discussed from the point of view of the essential economics, the possibilities of control through air conditioning and the role of the physician in industry and in private practice. Since many able-bodied men will probably be inducted into military service, industry may need to recruit workers from the physically handicapped and from the aging groups. These developments, of enormous medical and social significance, will be featured at the congress. Assignment of this type of worker into industry with proper consideration of physical ability and mental aptitude will be fully considered. Concern has been expressed about the availability of trained personnel in industrial health, the subject of an early resolution by the Committee on Medical Preparedness of the American Medical Association. A session will be devoted to determining what shortages exist and the best means for correction. It is hoped that concrete proposals for better training for the industrial nurse, the industrial hygienist, the safety engineer and the physician in industry may grow out of these discussions. A means will also be provided for the interchange of experience and results of recent activity by committees on industrial health in state and county medical societies.

The congress promises to provide an unusual opportunity to the medical profession to grasp a sense of its potential contribution to improved physical well-being among the employed population.

Current Comment

NARCOTIC PEDLERS IMPOSE ON PHYSICIANS' WIDOWS

From the Bureau of Narcotics in Washington comes a warning from the Commissioner, Mr. H. J. Anslinger, which should be widely disseminated among physicians and their families. Illicit traffickers in narcotics have in some instances recently developed a technic with which they were able to swindle either the widows or members of the families of physicians who had recently died. Apparently these pedlers watched the daily papers for the notices of deaths of physicians. Shortly after the publication of such a notice of death the trafficker appeared and represented himself to be "a narcotic appraiser," stating that he represented a federal agency and seeking to induce the survivors of the physician to turn over to him whatever narcotics might be found among the effects of the deceased. Thus far attempts have been made only on the families of physicians. It seems probable, however, that a similar attempt might be made in connection with stocks of narcotics held by druggists. Physicians and druggists everywhere should be warned against this type of fraud.

TUMORS IN TWINS

Macklin[1] recently appealed to physicians through medical journals for reports of cases of tumors in twins. Twenty case reports were thus obtained, seventeen of which had not been included previously in the literature. The author collected from the literature reports of fifty-three pairs of monozygous twins and thirty-five pairs of dizygous twins in which tumors occurred in either one or both twins. The newly discovered cases, together with those previously reported, were analyzed. It was found that tumors affect both members of a monozygous twin pair far more frequently than they affect both members of a dizygous twin pair. The tumor was of the same type and occurred in the same organ much more frequently in the monozygous than in the dizygous twin group. The age of onset of the tumors was more nearly identical in the monozygous than in the dizygous twins. The average difference in age of onset of the tumors in several pairs of identical twins in which both twins were affected was only 0.6 year, whereas in the fraternal twin pairs in which both twins were affected with tumors the average time elapsing between the ages of onset was 2.9 years, or five times as long. These observations appear to indicate that heredity plays an important part in tumor production and in the age of onset.

CARCINOGENIC LIPOID IN HUMAN CANCER

The extraction of a fat-soluble carcinogenic factor from primary breast cancer of man has been reported recently by Menke[1] of the Department of Surgery, Stanford University School of Medicine. Two primary carcinomas of the breast were excised by the Stanford surgeons, ground to a hash and subjected to repeated extraction with fat solvents in a Soxhlet apparatus. Acetone, ethyl ether, purified petroleum benzin and absolute ethyl alcohol were used in the order mentioned. The four extracts thus obtained from each tumor were pooled and evaporated to dryness, and samples of the resulting products were injected subcutaneously in the lower mammary region of virgin female mice. One tumor mass developed at the site of the injection in each series. The masses became palpable between the 229th and the 282d day and grew rapidly after this date, reaching about 2 cm. in diameter in from two to three weeks. At this stage each new growth was firmly adherent to and had already penetrated the abdominal walls. Gross metastases were not found. Histologically each tumor was a spindle cell sarcoma. Fragments transplanted to normal mice grew rapidly. Each transplant resulted in a 2 cm. ulcerating mass by the twentieth day. Spontaneous tumors failed to occur in 200 control mice during the course of the investigation. The chemical nature of this newly discovered human carcinogenic lipoid and its possible antigenic properties are now under investigation.

1. Macklin, Madge Thurlow: An Analysis of Tumors in Monozygous and Dizygous Twins, with a Report of Fifteen Unpublished Cases, J. Heredity **31**: 277 (June) 1940.
1. Menke, J. F.: Science **92**: 290 (Sept. 27) 1940.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

THE NAVAL RESERVE

The Secretary of the Navy has stated that naval reservists are serving in practically every type of ship of the fleet and in administrative duties ashore. Since the emergency proclamation by the President, Sept. 8, 1939, the officers and men of the Naval Reserve, excepting men of the Fleet Reserve, have reported for duty on a voluntary basis. The rapid acquisition of ships for auxiliaries, patrol and harbor defense duties necessitated, however, placing the organized Naval Reserve on a compulsory basis, which the Secretary of the Navy did October 5. The Navy Department indicated that, as of Oct. 26, 1940, 2,500 Naval Reserve officers of all classes were on duty and 4,000 enlisted men, not including the Fleet Reserve.

The Naval Reserve has numerous projects under way at this time, giving officers and men special training, with active duty available for all candidates who volunteer on completion of the courses. Among the classes for officers are flight aviation medicine at Pensacola, Fla., supply corps school at Washington, D. C., chemical warfare school at Edgewood Arsenal, Maryland, industrial procurement at the Army War College, merchant marine training centers in New York and San Francisco, the harbor defense school at Boston, for the training of engineer officers of organized divisions assigned to local defense duties and the Naval Reserve midshipmen schools, aboard the U. S. S. *Illinois*, New York, and at Abbott Hall, Northwestern University, Chicago. The last two schools are part of the Navy's program to train approximately 4,000 line ensigns of the Naval Reserve qualified for duty afloat. A third school will be opened at the Naval Academy in February 1941.

MEDICAL SUPPLIES FOR ENGLAND

The Medical and Surgical Supply Committee of America, with headquarters at 420 Lexington Avenue, New York, comprising 265 physicians throughout the United States, was formed last August to secure medical supplies to be sent overseas for aid to the civilian population in England. The committee announces that already more than $40,000 in medical and surgical supplies has been shipped abroad. Among the supplies donated were a portable x-ray machine, a portable anesthesia unit, five barrels of surgical instruments, diamond earrings valued at $1,000 to be converted into cash to purchase medical equipment, and an operating kit valued at $400. Druggists and pharmaceutic and supply houses have sent thousands of hypodermic needles valued at $7,000, Luer syringes, large quantities of bandage, drugs, hundreds of surgeon's gloves, and other valuable equipment.

Another organization, Bundles for Britain, Inc., 29 West 57th Street, New York, has formed a medical and surgical supply department, but it is in no way affiliated with the Medical and Surgical Supplies Committee of America, the executive chairman of which is Mrs. Ronald B. Balcom. The sole function of the Medical and Surgical Supply Committee of America is to assemble medical supplies and instruments from donors, to inspect the material, restore the surgical instruments, and then ship them abroad for use in emergency hospitals and field units in Great Britain.

OHIO CHIEF OF SELECTIVE SERVICE

Dr. Howard E. Boucher, Columbus, lieutenant colonel and executive officer of the 112th Medical Regiment, Ohio National Guard, has been appointed chief medical officer of Selective Service in Ohio. There will be three medical induction centers in Ohio: Fort Hayes at Columbus, and at Toledo and Cleveland. The Committee on Medical Preparedness has furnished to the governor a list of qualified physicians for positions as medical examiners and alternate examiners for the 330 local draft boards.

NATIONAL DEFENSE NIGHT

The program of the Philadelphia County Medical Society, Philadelphia, November 13, was devoted to national defense. The speakers were Dr. William DeKleine, Washington, D. C., medical director, American Red Cross, on "Red Cross Participation in Medical Defense"; Brig. Gen. Leigh C. Fairbank, chief, Dental Corps, U. S. Army, Washington, D. C., "The Part Dentists Play in National Defense," and Rear Admiral Adolphus E. Watson, commandant, Fourth Naval District, Philadelphia, "The Navy Ashore." Certificates were conferred on members in practice for fifty years. The program was presented in collaboration with the W. W. Keen chapter, Association of Military Surgeons of the United States.

LECTURES ON MILITARY MEDICINE

Recent lectures in the series on military medicine sponsored by the Philadelphia County Medical Society are as follows:

Dr. Isidor S. Ravdin, Advances in Therapeusis as Related to War Surgery, October 17.

Major James B. Mason, Medical Corps, U. S. Army, Tissue Reaction to Missiles of War—Ballistics; also Dr. William Bates, The Surgery of War as Contrasted with Industrial Surgery, October 24.

Dr. Robert H. Ivy, Maxillofacial and Reconstructive Surgery in War, October 31.

Dr. Max M. Strumia, Transfusions of Blood and Hematologic Substitutes in Advanced Medical Installations in War, November 7.

The present series of thirteen lectures ends early in December; another series will follow shortly thereafter.

The society recently reported that 1,212 questionnaires have been returned to its office from those sent out to obtain data concerning availability of local phy-

sicians for service in the event of a national emergency. Of this number 729 were from members of the society and 483 from nonmembers. There are about 4,200 physicians in Philadelphia, it was pointed out.

AMERICAN MOBILIZATIONS

According to a statistical study made by the U. S. Veterans' Administration, Washington, D. C., America mobilized 350,000 men for the American Revolutionary War, 527,650 for the war of 1812, 107,631 for the war with Mexico, 2,128,948 (Union forces only) for the Civil War, 280,564 for the Spanish-American War, 130,000 for the Indian wars and 4,791,172 for the World War. The average age of the World War doughboy, according to the Associated Press in commenting on the foregoing statistics, is now 47 years and of the Spanish-American veteran 65. The Civil War campaigner averages 95. The Veterans' Administration statistical study shows that 4,041,017 World War veterans were living at the beginning of 1940.

PSYCHIATRIC PROBLEMS

A symposium on psychiatric problems concerning military conscription was presented before the Medical Society of St. Elizabeths Hospital, Washington, October 22; the speakers were Capt. Dallas G. Sutton, U. S. Navy, Lieut. Col. William C. Porter, U. S. Army, and Dr. Harry Stack Sullivan.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

FIRST CORPS AREA

The following medical reserve officers have been ordered to extended active duty with the regular army by headquarters of the First Corps Area, which comprises the states of Maine, Massachusetts, Connecticut, New Hampshire, Vermont and Rhode Island:

ALLEN, Eugene E., 1st Lieut., Milford, Mass.
ALPERT, George R., 1st Lieut., Brookline, Mass.
ANDERSON, Karl V., 1st Lieut., Derby, Maine.
ANDREN, Henry E., 1st Lieut., Boston.
ASCHER, David S., 1st Lieut., Boston.
BACHRACH, Samuel, 1st Lieut., Maynard, Mass.
BARALD, Fred C., 1st Lieut., New Haven, Conn.
BOYER, Samuel H., 1st Lieut., Winchester, Mass.
BURKE, Jacob B., 1st Lieut., Chelsea, Mass.
CARPENTIERI, Anthony L., 1st Lieut., New Haven, Conn.
CASERTA, Silvio J., 1st Lieut., Bridgeport, Conn.
CLOUGH, Herbert T. Jr., 1st Lieut., Bangor, Maine.
CORCORAN, John J., 1st Lieut., West Roxbury, Mass.
DONAGHY, George E., 1st Lieut., Boston.
DORFMAN, Jacob, 1st Lieut., Hartford, Conn.
EGAN, William J., 1st Lieut., Dorchester, Mass.
FICICCHY, John Jr., 1st Lieut., Hyde Park, Mass.
FOLEY, John J., 1st Lieut., Malden, Mass.
FOX, Lester I., 1st Lieut., Quincy, Mass.
FREEDMAN, Stanley S., 1st Lieut., Providence, R. I.
GARDINER, Harry M., 1st Lieut., Harding, Mass.
GOLDMAN, Max, 1st Lieut., Boston.
GRIFFIN, Julian P., 1st Lieut., Indian Orchard, Mass.
HEIFETZ, Ralph, 1st Lieut., Portland, Maine.
HYDE, Robert W., 1st Lieut., Fairfax, Vt.
JACOBS, Harry, 1st Lieut., Concord, Mass.
JOHNSON, Paul E., 1st Lieut., Attleboro, Mass.
KASPARIAN, Karl D., 1st. Lieut., Dorchester, Mass.
LEVINE, Samuel, Captain, Lynn, Mass.
McCABE, George E., 1st Lieut., Arlington, Mass.
McCARTHY, Robert J., 1st Lieut., Dorchester, Mass.
McWETHY, Wilson H., 1st Lieut., Augusta, Maine.
MERLIN, Samuel A., Captain, Dorchester, Mass.
MOSKOVITZ, Abraham J., 1st Lieut., Burlington, Vt.
ROBEY, Nathaniel C., Captain, Newton Centre, Mass.
ROGELL, David, 1st Lieut., Warren, R. I.
ROSEN, Daniel, 1st Lieut., Roxbury, Mass.
RUBIN, Abraham, 1st Lieut., Pittsfield, Mass.
RUBINO, Bernard C., 1st Lieut., Baldwinsville, Mass.
SILVER, Gershon B., 1st Lieut., Hartford, Conn.
SINCLAIR, Edmond B., 1st Lieut., Providence, R. I.
STANKARD, William F., 1st Lieut., Stamford, Conn.
SWANN, William K. Jr., 1st Lieut., Boston.
TEMPLE, Francis E., 1st Lieut., Providence, R. I.
THOMAS, John M. Jr., 1st Lieut., Woodstock, Vt.
WIENER, Harry J., 1st Lieut., Revere, Mass.
WIEMERS, Eugene L., 1st Lieut., Concord, N. H.
ZELTZERMAN, Israel, 1st Lieut., Foxboro, Mass.

THIRD CORPS AREA

The following medical reserve corps officers have been ordered to extended active duty by the commanding general of the Third Corps Area, which includes the states of Pennsylvania, Virginia, the District of Columbia and Maryland:

BOYCE, Bingham, Captain, Bridgeville, Pa.
BRYLAWSKI, Michael, 1st Lieut., Philadelphia.
BUSH, Herman, 1st Lieut., Beaver Falls, Pa.
CARROLL, Edward Joseph, Jr., Captain, Pittsburgh.
COHEN, Max Harry, 1st Lieut., Washington, D. C.
COVALESKY, Victor John, 1st Lieut., Allentown, Pa.
DIXON, Joseph Moore, Captain, Roanoke, Va.
DELP, Charles William, Captain, St. Clair, Pa.
ERHARD, Elmo Enos, Captain, Curwensville, Pa.
FLUEGEL, Gerald Nicholas, Captain, Wilkes-Barre, Pa.
GERWIG, Walter Henry, Jr., 1st Lieut., Baltimore.
GORDON, Armand Byron, 1st Lieut., Washington, D. C.
HARRISON, Malcolm D., 1st Lieut., Washington, D. C.
JANJIGIAN, Edward Rupen, 1st Lieut., Danville, Pa.
KIRK, Milo Miller, 1st Lieut., Pittsburgh.
MANSFIELD, William Kenneth, 1st Lieut., Baltimore.
MASON, James B., Major, Philadelphia.
McLAUGHLIN, William B., Captain, Pittsburgh.
MILLIGAN, Alexander McLeod, Lieut. Col., Pittsburgh.
MOGAN, Christopher Joseph, Captain, Philadelphia.
SCHUBART, George Rudolph, 1st Lieut., Drexel Hill, Pa.
SHOWALTER, Josiah Thomas, 1st Lieut., Cambria, Va.
SONES, Maurice, 1st Lieut., Philadelphia.
STEIN, Arthur Julian, 1st Lieut., Philadelphia.
THOMAS, Preston Whitney, 1st Lieut., Pittsburgh.
TOLSTOI, George, 1st Lieut., Washington, D. C.
UHDE, George Irvin, 1st Lieut., Kennett Square, Pa.
URBAITIS, John Charles, Captain, Frankford, Pa.
VAN BUSKIRK, Frederick William, 1st Lieut., Pottstown, Pa.
WEST, George Brooks, Lieut. Col., Norfolk, Va.
WHITE, George Seese, 1st Lieut., Uniontown, Pa.
YINGLING, Paul Louis, 1st Lieut., Shippenville, Pa.

FOURTH CORPS AREA

The following medical reserve corps officers have been ordered to extended active duty by the commanding general of the Fourth Corps Area, which includes the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana. Their rank, home address and station are indicated.

AARON, George, 1st Lieut., New Orleans, Camp Blanding, Fla.
ADAMS, Edward N., Captain, Florence, S. C., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
ASKEW, Rufus A., 1st Lieut., Atlanta, Ga., Fort Bragg, N. C.
ASKEW, William M. Jr., 1st Lieut., Greenville, Ala., Camp Blanding, Fla.
ASKIN, Henry E., 1st Lieut., Alexander City, Ala., Camp Shelby, Miss.
BATEMAN, Needham B., Captain, Atlanta, Ga., Rctg. Serv., Atlanta, Ga.
BECK, Chester K., 1st Lieut., Troy, Ala., Fort Screven, Ga.
BENNETT, Basil T. Jr., 1st Lieut., Trenton, Tenn., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
BENTON, George R., 1st Lieut., Goldsboro, N. C., Camp Beauregard, La.
BERMAN, Maxwell D., Captain, Jackson, Miss., Camp Shelby, Miss.
BLUMBERG, Max N., 1st Lieut., Macon, Ga., Fort Jackson, S. C.
BOLLING, Harlis O., 1st Lieut., Kingsport, Tenn., C. A. Laboratory, Fort Benning, Ga.
BOS, Howard C., 1st Lieut., Waycross, Ga., Fort Jackson, S. C.
BOYKIN, James T., 1st Lieut., Lewisburg, Tenn., 9th Div., Fort Bragg, N. C.
BRABHAM, Vance W. Jr., 1st Lieut., Augusta, Ga., Fort Bragg, N. C.

BRACKSTONE, LeRoy B., 1st Lieut., Iuka, Miss., 8th Div., Fort Jackson, S. C.
BRAMLETT, Eugene V., 1st Lieut., Oxford, Miss., Fort Jackson, S. C.
BROOKS, Marshall J. Jr., 1st Lieut., Atlanta, Texas, Fort McClellan, Ala.
BRUTON, Ogden C., Captain, Nashville, Tenn., Fort McClellan, Ala.
BRYAN, Malvern T., 1st Lieut., Memphis, Tenn., Fort Jackson, S. C.
BRYAN, Phillips R., 1st Lieut., Reynolds, Ga., Fort Oglethorpe, Ga.
BURDINE, Winston E., 1st Lieut., Marble Hill, Ga., 8th Div., Fort Jackson, S. C.
BURKETT, Howard M., 1st Lieut., Memphis, Tenn., Camp Beauregard, La.
BUSH, James LeSesne, Captain, Dublin, Ga., Rctg. Serv., Memphis, Tenn.
CAMPBELL, Edmond C., 1st Lieut., Morganza, La., Camp Shelby, Miss.
CAMPBELL, Guy, 1st Lieut., Jena, La., Fort Bragg, N. C.
CARNEY, Henry M., Captain, Nashville, Tenn., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
CARTER, Thomas S., Captain, Miami, Fla., Fort Bragg, N. C.
CHAPMAN, Jules B., 1st Lieut., Jacksonville, Fla., Fort Bragg, N. C.
CHESSON, Andrew L., 1st Lieut., Elizabeth City, N. C., Camp Beauregard, La.
CHILTON, Alfred M., 1st Lieut., Anniston, Ala., 4th Div., Fort Benning, Ga.
COMER, Edward T., Captain, Eufaula, Ala., Camp Beauregard, La.
COOPER, Charles F. Jr., 1st Lieut., Macon, Ga., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
COYLE, Daniel J., 1st Lieut., Birmingham, Ala., Camp Shelby, Miss.
COYLE, Elda S., 1st Lieut., Plain Dealing, La., Fort McClellan, Ala.
CRAIGHEAD, Claude C., 1st Lieut., Athens, Ga., Camp Blanding, Fla.
CREE, Maurie B., 1st Lieut., Concord, N. C., Camp Shelby, Miss.
DABNEY, William M., 1st Lieut., Okolona, Miss., Fort Jackson, S. C.
DALE, Sebron C., 1st Lieut., Jackson, Miss., Camp Beauregard, La.
DARDEN, William H., 1st Lieut., Birmingham, Ala., Fort McClellan, Ala.
DARNALL, Robert M., 1st Lieut., Union City, Tenn., Camp Shelby, Miss.
DAVIS, Julian W., 1st Lieut., Birmingham, Ala., Fort Benning, Ga.
DeLEO, Caesar A., 1st Lieut., New Orleans, Camp Beauregard, La.
DIAZ, Walter P., 1st Lieut., New Orleans, Camp Shelby, Miss.
DYER, John D., 1st Lieut., Van Vleet, Miss., Fort Bragg, N. C.
EDWARDS, Arthur M., 1st Lieut., Bernice, La., Camp Beauregard, La.
EDWARDS, Elbert E. Jr., 1st Lieut., Bells, Tenn., Camp Beauregard, La.
EGLESTON, Joseph D. Jr., 1st Lieut., Old Hickory, Tenn, Camp Shelby, Miss.
ELLINGTON, Joseph C., 1st Lieut., Alto, La., Fort Jackson, S. C.
ELLIS, Edward W., 1st Lieut., Knoxville, Tenn., Camp Shelby, Miss.
FEDER, Alexander J., 1st Lieut., Franklington, La., Camp Shelby, Miss.
FEDUCIA, Samuel J., 1st Lieut., Cotton Valley, La., Camp Beauregard, La.
FENDLER, Benny, 1st Lieut., Memphis, Tenn., Camp Beauregard, La.
FINEBERG, Henry H., 1st Lieut., New Orleans, Camp Shelby, Miss.
FITTS, William L. III, 1st Lieut., New Orleans, Camp Blanding, Fla.
FRANKEL, David E., 1st Lieut., Waycross, Ga., Camp Blanding, Fla.
FREEDMAN, Harold D., 1st Lieut., Senatobia, Miss., Fort McClellan, Ala.
GARLAND, William J., 1st Lieut., Logansport, La., Camp Beauregard, La.
GILREATH, Robert A., Captain, Henderson, N. C., Fort Bragg, N. C.
GLASSBERG, Irving J., 1st Lieut., New Orleans, Camp Shelby, Miss.
GLASS, Thomas A. Jr., 1st Lieut., Shreveport, La., Fort McClellan, Ala.
GLAZER, Harry, 1st Lieut., Montgomery, Ala., Rctg. Serv., New Orleans.
GLISSON, Charles S. Jr., Captain, Atlanta, Ga., Fort Bragg, N. C.
GOLDSTEIN, Nathan, 1st Lieut., New Orleans, Camp Blanding, Fla.
GRACE, Kenneth D., 1st Lieut., La Grange, Ga., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
GREEN, Albert H., Captain, Birmingham, Ala., Camp Beauregard, La.
GWIN, John V., 1st Lieut., New Orleans, Fort Barrancas, Fla.
HAIR, Morris J., Captain, LeCompte, La., Camp Beauregard, La.
HANAHAN, Ralph B., 1st Lieut., Florence, S. C., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
HARLOW, John R., 1st Lieut., Jonesboro, La., 4th Div., Fort Benning, Ga.
HARMON, James P., 1st Lieut., Quincy, Fla., 4th Div., Fort Benning, Ga.
HART, William W., 1st Lieut., Riggold, La., Camp Beauregard, La.
HARVEY, Robert H., Captain, Erwin, Tenn., Fort Oglethorpe, Ga.
HASSELTINE, Lee L., 1st Lieut., Carville, La., Fort Oglethorpe, Ga.
HAWES, James B., 1st Lieut., Greenville, N. C., Fort Benning, Ga.
HEAD, Homer Jr., 1st Lieut., Chattanooga, Tenn., Fort Jackson, S. C.
HEATH, Rudolph W., 1st Lieut., Tampa, Fla., Fort Jackson, S. C.
HEMBREE, John A., Captain, Jeffersonville, Ga., Camp Shelby, Miss.
HENDRIX, Richard W., Captain, Evergreen, Ala., Camp Shelby, Miss.
HENSHALL, George K. Jr., 1st Lieut., Chattanooga, Tenn., Fort Moultrie, S. C.
HERAULT, Pierre C. Jr., 1st Lieut., Atlanta, Ga., 2d Armored Div., Fort Benning, Ga.
HILL, OTHO R., Captain, Lebanon, Tenn., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
HOGAN, Cecil M., 1st Lieut., Jacksonville, Fla., 8th Div., Fort Jackson, S. C.
HOLDEN, Howard T., 1st Lieut., Rabun Gap, Ga., Army Medical Center, Washington, D. C.
HOOVER, William M. Jr., 1st Lieut., Coral Gables, Fla., Camp Shelby, Miss.
HOPKINS, George S., 1st Lieut., Lake Providence, La., Camp Shelby, Miss.
HOWELL, Robert P., Captain, Lake Charles, La., Camp Beauregard, La.
HUMBERT, Walter C., Captain, Erwin, Tenn., Camp Beauregard, La.
HUNTER, John W. Jr., 1st Lieut., Birmingham, Ala., Camp Blanding, Fla.
IRWIN, Thomas M., 1st Lieut., Orlando, Fla., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
JAMES, Lorenzo, 1st Lieut., Haynesville, Ala., Camp Blanding, Fla.
JAMISON, Andrew M. Jr., 1st Lieut., Spartanburg, S. C., Fort Jackson, S. C.
JOHNSTON, William O., 1st Lieut., Charlotte, N. C., Camp Shelby, Miss.
KIMMELL, William F., 1st Lieut., Memphis, Tenn., Camp Shelby, Miss.
KNIGHTON, James E., 1st Lieut., Shreveport, La., Fort McClellan, Ala.
KUSHNER, Louis Z., Captain, Lake Charles, La., Camp Beauregard, La.
LaBARGE, Oza J., 1st Lieut., New Orleans, Camp Beauregard, La.
LaNASA, Matthew J., 1st Lieut., Baton Rouge, La., Camp Peay, Tullahoma, Tenn.
LARY, John H., 1st Lieut., Huntsville, Ala., 4th Div., Fort Benning, Ga.
LEIDENHEIMER, Henry Jr., 1st Lieut., New Orleans, Camp Shelby, Miss.
LEWIS, Arthur N., 1st Lieut., Mobile, Ala., 4th Div., Fort Benning, Ga.
LUCAS, Robert L., Captain, Winfield, Ala., Fort McClellan, Ala.
McCARN, Dan W., 1st Lieut., Warrior, Ala., Camp Shelby, Miss.
McCLARY, George R., 1st Lieut., Miami, Fla., Camp Peay, Tenn.
McCONNELL, Hiram A., 1st Lieut., Bunkie, La., Camp Shelby, Miss.
McELWEE, Newell E. Jr., 1st Lieut., Crowville, La., Camp Beauregard, La.
McGINNIS, Perry A., Captain, Bean Station, Tenn., Rctg. Serv., Knoxville, Tenn.
McGINTY, Howard C., 1st Lieut., Statesboro, Ga., 8th Div., Fort Jackson, S. C.
McVEA, Charles, 1st Lieut., Baton Rouge, La., Fort Moultrie, S. C.
MAJURE, Ernest O., 1st Lieut., Wetumka, Ala., Camp Blanding, Fla.
MARTIN, Farris J., 1st Lieut., Montgomery, Ala., Camp Shelby, Miss.
MASSENGILL, Robert C., 1st Lieut., Brookhaven, Miss., Camp Shelby, Miss.
MAY, William P., 1st Lieut., Winston-Salem, N. C., Fort McClellan, Ala.
MELCHER, Willis A., 1st Lieut., Wilson, N. C., Camp Blanding, Fla.
MERRIAM, Lucius B., 1st Lieut., Waynesboro, Miss., Camp Blanding, Fla.
MINOR, Walter H. Jr., Captain, Mobile, Ala., Camp Beauregard, La.
MONSKY, David B., 1st Lieut., Montgomery, Ala., Rctg. Serv., Montgomery, Ala.
MYERS, Onnie P., 1st Lieut., Indianola, Miss., Fort McClellan, Ala.
NEWELL, Charles E., Captain, Pineville, La., Fort Jackson, S. C.
NOBLE, William, 1st Lieut., Attalla, Ala., Fort McClellan, Ala.
NORTON, John W. R., Captain, Chapel Hill, N. C., Fort Bragg, N. C.
NOTO, Joseph J., 1st Lieut., Baton Rouge, La., 9th Div., Fort Bragg, N. C.
OLIVER, Ernest B., 1st Lieut., Birmingham, Ala., Camp Shelby, Miss.
OLSON, John R., 1st Lieut., Nashville, Tenn., Camp Blanding, Fla.
OWINGS, Franklin D., 1st Lieut., Rockwood, Tenn., Camp Beauregard, La.
PARKS, Richard H., 1st Lieut., Cross Hill, S. C., Camp Shelby, Miss.
PAULLUS, George E. Jr., Captain, Memphis, Tenn., Camp Shelby, Miss.
PHILLIPS, James R., 1st Lieut., Baton Rouge, La., Camp Blanding, Fla.
PHILLIPS, Stonewall J., Captain, Oakdale, La., Fort Jackson, S. C.
PLOTKIN, Oscar M., 1st Lieut., Columbia, S. C., Fort Bragg, N. C.
PRICE, Vivian H., 1st Lieut., Shreveport, La., Fort Bragg, N. C.
PRITCHARD, Clarence D., 1st Lieut., Marks, Miss., Camp Shelby, Miss.
RAY, Emmett B., 1st Lieut., Kosciusko, Miss., Camp Beauregard, La.
RICHARD, GOLDEN G., 1st Lieut., Lake Arthur, La., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
RING, Harold H., Captain, Savannah, Ga., Fort Screven, Ga.
RING, Louis J., 1st Lieut., Mount Olive, N. C., Camp Shelby, Miss.
ROANE, Henry S. Jr., 1st Lieut., Ruston, La., Camp Shelby, Miss.
ROBERTS, Roy F., 1st Lieut., Asheville, N. C., Camp Shelby, Miss.
ROBINSON, John F., 1st Lieut., Anderson, S. C., Camp Shelby, Miss.
ROBINSON, Robert L., 1st Lieut., Mars Hill, N. C., Camp Blanding, Fla.
ROBSON, Frank Y., 1st Lieut., Tampa, Fla., Fort Jackson, S. C.
ROGERS, James T., Captain, Gainesville, Ga., 4th C. A. Hdqrs., Atlanta, Ga.
RUDD, James C., Captain, Greensboro, N. C., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
SASLAW, Milton S., Captain, Miami, Fla., Camp Shelby, Miss.
SCHMIDT, Henry L. Jr., 1st Lieut., Brunswick, Ga., 8th Div., Fort Jackson, S. C.
SCOTT, Wood H., 1st Lieut., Bonita, La., Fort McClellan, Ala.
SHELTON, James B., 1st Lieut., Bessemer, Ala., Camp Shelby, Miss.
SHULL, Harrison J., Captain, Shelbyville, Tenn., 8th Div., Fort Jackson, S. C.
SIMMONS, Shelton C. Jr., 1st Lieut., East Point, Ga., Camp Beauregard, La.
SLAUGHTER, William J., 1st Lieut., DeKalb, Miss., Camp Beauregard, La.
SMITH, Jack I., 1st Lieut., Mooresville, Ala., Camp Blanding, Fla.
SNELLING, David B., 1st Lieut., Eutaw, Ala., Fort Jackson, S. C.
STANDER, Leonard H., 1st Lieut., Istrouma, La., Camp Shelby, Miss.
STEWARD, Williams D., 1st Lieut., Ooltewah, Tenn., Fort Benning, Ga.
STEWART, John R., 1st Lieut., Minden, La., Camp Blanding, La.
SULLIVAN, Joseph T., 1st Lieut., Asheville, N. C., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
SWEARINGEN, David C., Captain, Shreveport, La., Camp Shelby, Miss.
TAYLOR, Guy F., 1st Lieut., Laurel Springs, Tenn., Savannah Anti-Aircraft Firing Center, Savannah, Ga.
THOMAS, William C., Captain, Siler City, N. C., Fort Bragg, N. C.
TOPP, Oltert W., 1st Lieut., Greenville, S. C., Fort Bragg, N. C.

UNDERWOOD, James W., 1st Lieut., Birmingham, Ala., Camp Beauregard, La.
VOORHIES, Norton W., 1st Lieut., New Orleans, La., 9th Div., Fort Bragg, N. C.
WARREN, John B., 1st Lieut., Piney Flats, Tenn., 4th Div., Fort Benning, Ga.
WARSHAUER, Samuel E., 1st Lieut., Wilmington, N. C., Camp Shelby, Miss.
WATSON, James E., 1st Lieut., Memphis, Tenn., Camp Beauregard, La.
WEBB, John K., 1st Lieut., Columbia, S. C., 4th Div., Fort Benning, Ga.
WEINBERGER, Jacob, 1st Lieut., Jamestown, Tenn., Rctg. Serv., Jackson, Miss.
WEINREB, Joseph, Captain, Jacksonville, Fla., Rctg. Serv., Jacksonville, Fla.
WELLS, James H., 1st Lieut., Ruston, La., Fort Bragg, N. C.
WHITE, William E., 1st Lieut., Anniston, Ala., Fort McClellan, Ala.
WILKINSON, Charles F. Jr., 1st Lieut., Atlanta, Ga., Fort Jackson, S. C.
WILLIAMS, Alton F., 1st Lieut., Metter, Ga., Fort Jackson, S. C.
WILLIAMS, John W., 1st Lieut., Greenville, Miss., Camp Blanding, Fla.
WILLIEN, Leon J., Captain, Knoxville, Tenn., Camp Blanding, Fla.
WILSON, James R., 1st Lieut., Thomson, Ga., Fort Jackson, S. C.
WINDHAM, John E., 1st Lieut., Kosciusko, Miss., Camp Shelby, Miss.
WOOD, Frank A., 1st Lieut., Monroe, La., Fort Oglethorpe, Ga.
WOODRUFF, Gerald G., Captain, Anniston, Ala., Fort McClellan, Ala.
WORD, Samuel B., 1st Lieut., Birmingham, Ala., Camp Shelby, Miss.
WYATT, Thomas E., 1st Lieut., Union City, Tenn., Camp Beauregard, La.
YOUNG, George G., LaFayette, Ga., Fort Jackson, S. C.
ZALIN, Jacob, 1st Lieut., Walterboro, S. C., Fort Jackson, S. C.

SIXTH CORPS AREA

The following medical reserve corps officers in the Sixth Corps Area, which comprises Illinois, Wisconsin and Michigan, had been ordered by the Corps Area Commander to extended active duty up to November 8:

BALDWIN, Robert S., Captain, Marshfield, Wis.
BLOOM, Norman B., 1st Lieut., Milwaukee.
BROWN, Carroll A., 1st Lieut., Lincoln, Ill.
BUCZYNSKI, Charles C., Captain, Chicago.
BULMER, Dan J., 1st Lieut., Ann Arbor, Mich.
BURKHART, Jean M., 1st Lieut., Benton, Ill.
CASTRO, Cosimo, 1st Lieut., Chicago.
CAVELL, Roscoe W., Captain, Eloise, Mich.
CUNNINGHAM, Glenn D., 1st Lieut., Rock Island, Ill.
DISKIN, Herman E., 1st Lieut., Detroit.
DULIN, Theodore J., 1st Lieut., Kankakee, Ill.
EISELE, Paul L., Captain, Statesan, Wis.
ELLWOOD, Walter W., Captain, Chicago.
ERENBURG, Leon M., Captain, Chicago.
FARBER, Charles E., 1st Lieut., Grand Rapids, Mich.
GORDON, Hyman S., Captain, Coal City, Ill.
GOSS, Samuel B., 1st Lieut., Ann Arbor, Mich.
GRAY, Arthur S., 1st Lieut., Allen Park, Mich.
GREENBERG, Leo J., 1st Lieut., Chicago.
HELM, John E., 1st Lieut., Benton, Ill.
HICK, Ford K., Captain, Oak Park, Ill.
HOWE, George E., 1st Lieut., Francis Creek, Wis.
ILLYES, Roscoe O., 1st Lieut., Chicago.
JEROME, Bourne, Captain, Superior, Wis.
KATZ, Charles J., 1st Lieut., Oak Park, Ill.
LAWRENCE, Charles H., 1st Lieut., Chicago.
LEININGER, Alfred T., Captain, Rockford, Ill.
MILLER, Perry L., 1st Lieut., Adrian, Mich.
OLMSTED, Randolph F., Captain, Park Ridge, Ill.
POLLACK, Sampel, 1st Lieut., Chicago.
PUGSLEY, George W., 1st Lieut., Detroit.
PURVES, William L., 1st Lieut., Saginaw, Mich.
REGNER, Mathias F., 1st Lieut., Port Washington, Wis.
ROBINSON, LEON E., Captain, Aledo, Ill.
SARFATTY, Isaac J., Captain, West Allis, Wis.
SCHIFF, Joseph H., 1st Lieut., Chicago.
SINAIKO, Russell P., 1st Lieut., Chicago.
SMITH, Edward C., 1st Lieut., Chicago.
SPECTOR, Israel H., 1st Lieut., Chicago.
SPRUNK, Carl J., 1st Lieut., Detroit.
STAMELL, Benjamin B., 1st Lieut., Detroit.
SVERDLIN, Abe A., Captain, Milwaukee.
SWIONTKOWSKI, Stanley, Captain, Chicago.
THOMAS, Clyde O., Captain, Freeport, Ill.
WAGNER, Alphonse J., 1st Lieut., Brillion, Wis.
WATRY, Theodore D., 1st Lieut., Milwaukee.
WHITELEY, Robert K., 1st Lieut., Detroit.
VOLLMAR, George K., 1st Lieut., Detroit.
ZEMAN, Laddie W., 1st Lieut., Hinsdale, Ill.
ZIMMERMAN, Lazar E., Captain, Harvard, Ill.

EIGHTH CORPS AREA

The following medical reserve corps officers in the Eighth Corps Area, including the states of Texas, Colorado, Arizona and New Mexico, had been ordered to active duty by the Corps Area Commander up to November 8:

ADAMS, Blair S., 1st Lieut., Loveland, Colo.
AKERS, Elwyn N., 1st Lieut., Denver.
ALLAMON, Emmett Lafayette, 1st Lieut., Sabine Pass, Texas.
ALLISON, Albert Murphy, 1st Lieut., Alice, Texas.
ALTHAUS, John William August, Captain, Fort Worth, Texas.
ANDERSON, William Douglas, Captain, Claremore, Okla.
ARNOLD, George Kenneth, Captain, Dallas, Texas.
BENNETT, John B., Captain, Lamesa, Texas.
BLAIR, James Robert Jr., 1st Lieut., Big Spring, Texas.
BLAKE, John V. Jr., 1st Lieut., Floresville, Texas.
BONNSTETTER, Harold John, 1st Lieut., Bandera, Texas.
BULLOCK, Bernard Eugene, 1st Lieut., Clinton, Okla.
CARTER, James Weldon, 1st Lieut., Palestine, Texas.
CATON, McKee, Captain, McAllen, Texas.
COMPERE, Clinton Lee, 1st Lieut., Decatur, Texas.
CONE, Frank, 1st Lieut., Houston, Texas.
COOPER, Elmer E., 1st Lieut., Nogales, Ariz.
COTTON, William Walker, 1st Lieut., Clinton, Okla.
CRADEN, Paul Joseph, 1st Lieut., El Reno, Okla.
CREEL, Gurley A., 1st Lieut., Kermit, Texas.
CULL, Herbert Graham, 1st Lieut., Houston, Texas.
DANDRIDGE, William Shelton, 1st Lieut., Dallas, Texas.
DAVENPORT, Harbert, Jr., 1st Lieut., Jacksonville, Texas.
DUDGEON, Howard Rush Jr., 1st Lieut., Waco, Texas.
FISHER, H. Calvin, 1st Lieut., Denver.
FLAMM, Kenneth R., 1st Lieut., Amarillo, Texas.
FOERSTER, Hervey A., Captain, Oklahoma City.
FRACHTMAN, Hirsh Julian, 1st Lieut., Houston, Texas.
FUNK, Gustavus D., 1st Lieut., El Reno, Okla.
GARRETT, Leslie Moyers, 1st Lieut., Corpus Christi, Texas.
GILLILAND, James O., 1st Lieut., Pampa, Texas.
GONZALEZ, Juan C. Jr., 1st Lieut., Benavides, Texas.
GOODLOE, Basil Lynn, 1st Lieut., El Paso, Texas.
GOODRUM, William A., 1st Lieut., Phoenix, Ariz.
GUICE, Leroy Edward, Captain, Sabinal, Texas.
HAHN, William B., 1st Lieut., Columbus, Texas.
HALPIN, Frank W., Captain, Fort Worth, Texas.
HART, Gaylord A., 1st Lieut., Dallas, Texas.
HEATLY, Maurice Dean, 1st Lieut., San Antonio, Texas.
HELLAMS, Alfred Allen, 1st Lieut., Dallas, Texas.
HENRY, Colvern Dewey, Captain, San Antonio, Texas.
HOWARD, Glenn T., 1st Lieut., Bruni, Texas.
HUBBARD, John Russell, 1st Lieut., Oklahoma City
HUBBARD, Ralph W., Captain, Oklahoma City.
HUDSON, Granville W., 1st Lieut., San Antonio, Texas.
IVERS, William Maurice, 1st Lieut., Loveland, Colo.
JOHNSON, Homer B., 1st Lieut., Midland, Texas.
JONES, Thomas R., 1st Lieut., Beaumont, Texas.
JORDAN, Fred C. Jr., 1st. Lieut., Phoenix, Ariz.
KAHLER, Glenn E., 1st Lieut., Buckholtz, Texas.
KNOLLE, Ben E., 1st Lieut., Houston, Texas.
LAMBERSON, Harry Henry, 1st Lieut., Colorado Springs, Colo.
LANCASTER, G. M., 1st Lieut., Clovis, N. M.
LEGG, Eugene Pinsen, 1st Lieut., Dallas, Texas.
LIPAN, Edward M., 1st Lieut., Denver.
MARTIN, Howard C., 1st Lieut., Oklahoma City.
MARTIN, Scott Harrison, 1st Lieut., Hamilton, Texas.
MAXWELL, Ernest Arthur, 1st Lieut., San Antonio, Texas.
McCANN, Joseph William, 1st Lieut., Denver.
McCLOUD, Benjamin L. Jr., 1st Lieut., Graford, Texas.
McCONNELL, Jesse Maurice, 1st Lieut., Houston, Texas.
McGEE, Aubrey S., 1st Lieut., San Angelo, Texas.
MOURSUND, Walter H. Jr., Captain, Dallas, Texas.
NESTER, Charles R., 1st Lieut., Houston, Texas.
OLIVER, Thomas Mitchell, 1st Lieut., Waco, Texas.
ORR, Charles William, 1st Lieut., Houston, Texas.
PATTERSON, Fred Lindley Jr., 1st Lieut., Mountain View, Okla.
PAUL, William G., 1st Lieut., Durant, Okla.
PAULSON, Alvin Winfred, Captain, Clinton, Okla.
PAWOL, Sylvester Edward, 1st Lieut., Clovis, N. M.
PAYNE, Ralph B., 1st Lieut., Amarillo, Texas.
PETICOLAS, John D., 1st Lieut., El Paso, Texas.
PHILLIPS, Claude Mason, 1st Lieut., Austin, Texas.
PORTER, George Leslie, Captain, Dallas, Texas.
POST, Samuel Perry, 1st Lieut., Boerne, Texas.
PRATT, Perry G., 1st Lieut., Denver
REED, Emil Patrick, Captain, Brownsville, Texas.
RICHARDS, John Terrence, 1st Lieut., Rockdale, Texas.
ROBINSON, Harold L., Captain, Austin, Texas.
ROBISON, Edward W., 1st Lieut., Austin, Texas.
ROGERS, Galen Alonzo, Captain, Talihina, Okla.
RUCKER, John C. Captain, Dallas, Texas.
SALDIVAR, Julian Theodore, 1st Lieut, Austin, Texas.
SANFORD, Gilman E., 1st Lieut., Denver.
SCARBOROUGH, James S., Captain, Rusk, Texas.
SEASTRUNK, Oliver C., 1st Lieut., Franklin, Texas.
SHIVERS, George Clausman, Captain, Colorado Springs, Colo.

SPARKMAN, Robert Satterfield, 1st Lieut., Cincinnati.
STANLEY, John Frank, 1st Lieut., Yuma, Ariz.
STEGER, Joseph Hamilton, 1st Lieut., Fort Worth, Texas.
STILES, Wendel A., Captain, Dallas, Texas.
STOKES, Robert C., Captain, Vernon, Texas.
STOUGH, AUSTIN R., 1st Lieut., McAlester, Dkla.
THOMAS, Harold R., 1st Lieut., Austin, Texas.
TIGERTT, William D., 1st Lieut., Dallas, Texas.
TILDEN, James F., 1st Lieut., Olathe, Colo.
TUBBS, Harry Augustus, 1st Lieut., Temple, Texas.
TYLER, Monroe R., 1st Lieut., Eagle, Colo.
WALLACE, Gordon K., Captain, Dallas, Texas.
WEST, R. C., Captain, Hamilton, Texas.
WIERNIK, Harris, 1st Lieut., Lovelady, Texas.
WILSON, Harry G., 1st Lieut., Dallas, Texas.
WINBORN, Claude D., Captain, Dallas, Texas.
WINSHIP, Theodore O., 1st Lieut., Austin, Texas.
YARBROUGH, Cecil Gilbert Jr., 1st Lieut., Midland, Texas.
YATES, June, 1st Lieut., Grapevine, Texas.
ZINK, Linus Anthony, 1st Lieut., Pecos, Texas.

NINTH CORPS AREA

The following medical reserve corps officers of the Ninth Corps Area, which comprises the states of California, Oregon, Washington, Idaho, Montana, Wyoming, Utah and Nevada, had been ordered to active duty at the stations indicated by the Corps Area Commander, up to November 8:

ABRAMOPOULOS, Christos A., Major, San Francisco, 1st Military Area, Presidio of San Francisco.
ADAMS, Lewis N., 1st Lieut., Quinault, Wash., 2d Military Area, Portland, Ore.
ADAMS, Morgan K., 1st Lieut., Sanitarium, Calif., Fort Lewis, Wash.
ARONSON, Samuel F., 1st Lieut., Seattle, Camp Murray, Wash.
AUTARD, Eugene J., 1st Lieut., San Francisco, Presidio of Monterey and Fort Ord, Calif.
BENSON, Seymour, 1st Lieut., Los Angeles, Presidio of Monterey and Fort Ord, Calif.
BERNSTEIN, Theodore I., 1st Lieut., Los Angeles, Presidio of Monterey and Fort Ord, California.
BIVINS, Thomas E., 1st Lieut., Fort Bragg, Calif., Presidio of Monterey and Fort Ord, Calif.
BOVENMYER, Earl S., 1st Lieut., Pocatello, Idaho, Presidio of Monterey and Fort Ord, Calif.
BRUCE, Robert A., 1st Lieut., Los Angeles, Presidio of Monterey and Fort Ord, Calif.
BUMP, Robert I., 1st Lieut., Cheyenne, Wyo., Presidio of Monterey and Fort Ord, Calif.
CALCAGNO, Joseph S., 1st Lieut., San Jose, Calif., Presidio of Monterey and Fort Ord, Calif.
CHANDLER, Willard J., 1st Lieut., Woodburn, Ore., Vancouver Barracks, Wash.
CHAPMAN, Edwin S., 1st Lieut., San Fernando, Calif., Presidio of Monterey and Fort Ord, Calif.
CONOVER, George W. Jr., 1st Lieut., Wilbur, Wash., Fort Lewis, Wash.
CRALL, Herbert D., Lieut. Col., San Francisco, Surgeon's Office, Hq. Ninth Corps Area, Presidio of San Francisco.
DALE, Earl E., Major, Edgerton, Wyo., 3d Military Area, Salt Lake City.
DAVENPORT, Donald J., 1st Lieut., Los Angeles, Presidio of Monterey and Fort Ord, Calif.
DURHAM, Milton W., 1st Lieut., La Grande, Ore., Fort Lewis, Wash.
EARL, Donald H., 1st Lieut., San Pedro, Calif., Fort Macarthur, Calif.
EDELSON, Zanly C., 1st Lieut., San Francisco, Presidio of San Francisco.
EVANS, Carvel S., Captain, Salt Lake City, 3d Military Area.
EVERETT, Ernest G., 1st Lieut., Ashland, Ore., Presidio of Monterey and Fort Ord, Calif.
FEUSNER, Henry D., 1st Lieut., Los Angeles, Fort Rosecrans, Calif.
FEY, Louis D., 1st Lieut., Seattle, Fort Lewis, Wash.
FRANZI, Antoini J., 1st Lieut., San Francisco, Presidio of San Francisco.
GARDNER, Elsworth L., 1st Lieut., Eugene, Ore., Fort McDowell, Calif.
GIANELLI, Virgil J., 1st Lieut., Stockton, Calif., Fort Scott, Calif.
GROSSBLAT, Jacob, 1st Lieut., Los Angeles, 1st Military Area, Presidio of San Francisco.
GUYETT, Harvey E., 1st Lieut., Idaho Falls, Idaho, Fort Lewis, Wash.
HAVERSTOCK, Richard T., 1st Lieut., Seattle, Fort Lewis, Wash.
HICKMAN, Harry S., 1st Lieut., Davenport, Wash., Fort Lewis, Wash.
HOLTZ, Paul Roscoe, Major, Lander, Wyo., 3d Military Area, Salt Lake City.
HORWITZ, Emanuel, Captain, Alcatraz Island, Calif., Fort McDowell, Calif.
HUNTINGTON, William H., Lieut. Col., Portland, Ore., Fort Lewis, Wash.
ISAAC, Ralph W., 1st Lieut., Pomeroy, Wash., Vancouver Barracks, Wash.
JACKEMY, Edward J., 1st Lieut., Oakland, Calif., Presidio of Monterey and Fort Ord, Calif.
JUMBLATT, Albert, Captain, Pacific Beach, Calif., Fort Rosecrans, Calif.
KINGSTON, George R., 1st Lieut., Wenatchee, Wash., Fort Lewis, Wash.
KONIGSBERG, Jerome, 1st Lieut., San Francisco, Presidio of Monterey and Fort Ord, Calif.
LARSON, Rudolph V., Captain, Smithfield, Utah, Fort Lewis, Wash.
LEE, George F., Captain, Union, Ore., Fort Stevens, Ore.
LEVAN, Norman E., 1st Lieut., Los Angeles, 1st Military Area, Presidio of San Francisco.
LIND, Laurie P., Major, Portland, Ore., 2d Military Area.
LLOYD, Robert E., 1st Lieut., San Francisco, Fort Lewis, Wash.
MAGUIRE, Joseph F., 1st Lieut., Ventura, Calif., Presidio of Monterey and Fort Ord, Calif.
McDONALD, Frank J., Captain, Bakersfield, Calif., Presidio of Monterey and Fort Ord, Calif.
MELLO, Henry G., 1st Lieut., Alameda, Calif., Presidio of Monterey and Fort Ord, Calif.
NELSON, Walfred A., 1st Lieut., Salt Lake City, Salt Lake City, Utah, Recruiting Officer.
NEWSOM, Samuel J., Captain, Walla Walla, Wash., Fort Worden, Wash.
OHLMACHER, Joseph P., 1st Lieut., Missoula, Mont., Fort Lewis, Wash.
OSGOOD, Samuel B., 1st Lieut., Grants Pass, Ore., Presidio of Monterey and Fort Ord, Calif.
PEDERSEN, Christian B., Major, Tahoe, Calif., 1st Military Area.
QUALHEIM, Clarence B., Captain, Seattle, Fort Lewis, Wash.
RICH, David R., 1st Lieut., La Grande, Ore., Fort Lewis, Wash.
ROBBINS, Carl William, Lieut. Col., Eugene, Ore., Fort Lewis, Wash.
ROGERS, Thomas J., 1st Lieut., Los Angeles, Presidio of Monterey and Fort Ord, Calif.
SAWYER, Malcolm H., 1st Lieut., North Twin Falls, Idaho, 3d Military Area.
SENTER, Walter P., Captain, San Francisco, 1st Military Area.
SHAEFER, J. H., Lieut. Col., San Francisco, Surgeon's Office, Hq. Ninth Corps Area, Presidio of San Francisco.
SHARP, Paul W., 1st Lieut., Klamath Falls, Ore., Fort Lewis, Wash.
SHIER, Cyril W., Captain, Arcadia, Calif., Presidio of Monterey and Fort Ord, Calif.
SIRBU, Abraham B., 1st Lieut., San Francisco, Presidio of Monterey and Fort Ord, Calif.
SPRAGUE, Norman F., 1st Lieut., Beverly Hills, Calif., Presidio of Monterey and Fort Ord, Calif.
STRANQUIST, Henry C., Major, Ogden, Utah, 3d Military Area.
SZUKALSKI, Joseph P., 1st Lieut., Pasadena, Calif., 1st Military Area, Presidio of San Francisco.
TEN EYCK, Thomas G., Captain, Portland, Ore., Fort Lewis, Wash.
THOMAS, Leon B., Captain, Vancouver, Wash., Fort Lewis, Wash.
THOMPSON, Roger S., Captain, Seattle, Camp Murray, Wash.
TICHENOR, Ernest LaPoint, Captain, Fort Belknap, Harlem, Mont., 3d Military Area, Salt Lake City.
TOPPENBERG, David R., 1st Lieut., Loma Linda, Calif., Presidio of Monterey and Fort Ord, Calif.
VELONIS, Stamatis G., 1st Lieut., Nespelem, Wash., Fort Lewis, Wash.
VOGT, Paul R., 1st Lieut., The Dalles, Ore., Fort Lewis, Wash.
WHITAKER, Clifford W., Major, Tacoma, Wash., 2d Military Area, Portland, Ore.
WHITE, Alfred S., 1st Lieut., San Francisco, Presidio of Monterey and Fort Ord, Calif.
WOLF, Robert W., 1st Lieut., San Francisco, Presidio of San Francisco.
ZENER, Francis B., Major, Portland, Ore., Vancouver Barracks, Wash.

RESERVE PUBLIC HEALTH OFFICERS

The following physicians have taken their oaths as assistant surgeons in the reserve of the U. S. Public Health Service. Their home address and medical schools from which they graduated are indicated:

ALDRICH, Clarence K., New York, Northwestern University.
BEARDSLEY, Wayne P., Staten Island, N. Y., Jefferson Medical College.
BERKEBILE, Robert D., Cleveland, Ohio State University.
CARSTENSEN, Vincent H., New Orleans, State University of Iowa.
CRAWFORD, John G., Charlottesville, Va., University of Virginia.
FAGIN, Irving D., New York, New York University.
FARBER, David N., Staten Island, N. Y., Ohio State University.
FORAKER, Alvan G., Pittsburgh, University of Pittsburgh.
GERSTEN, Samuel, Staten Island, N. Y., Syracuse University.
HANNON, Harland N., Louisville, Ky., Kansas City University.
JONES, Charles W., Baltimore, University of Maryland.
KING, William D. Jr., Miami, Ariz., Baylor University.
LUCAS, Paul W., Baltimore, Duke University.
MacKILLOP, Daniel, Jr., Cambridge, Mass., Tufts College Medical School.
MURPHY, C. Henry, Staten Island, N. Y., Georgetown University.
MYERS, Mark E., Charlottesville, Va., University of Virginia.
RAPPAPORT, Eugene O., Staten Island, N. Y., University of Lausanne, Switzerland.
TRAIN, John B., New York, New York University.
VANDERHOOK, Ray H., Buffalo, College of Medical Evangelists.
WHITE, James N., Dallas, Texas, University of Texas.
WOLFE, Roy E., Denver, University of Colorado.

ORGANIZATION SECTION

EXHIBITS FOR MEDICAL SOCIETIES AND SCIENTIFIC ORGANIZATIONS

Exhibits pertaining to the work of the various departments of the American Medical Association and to subjects in which those departments are interested have been prepared for medical societies and other scientific organizations.

The exhibits are available on a loan basis. Responsibility for installation and demonstration of the exhibits ordinarily must be borne by the organization to which the material is lent. Except in special instances, the American Medical Association will be unable to send its own personnel for such duties.

Requests for material should be instituted as far in advance as possible, so that the proper reservations can be made. Exact shipping addresses and dates should be given when the request is made.

Further information may be obtained from
Director, Scientific Exhibit, American Medical Association,
535 North Dearborn Street, Chicago.

13. Medical Discoveries of a Century.

An exhibit, originally shown at A Century of Progress Exposition in Chicago, consisting of nine groups of figures—Beaumont, Morton, Pasteur, Lister, Roentgen, Theobald Smith, Curie, Ehrlich and Banting. Each group is set in a case with indirect lighting. Models are made of plaster and require great care in handling.

Space required, an area 10 feet wide by 6 feet deep (or 16 linear feet); no background necessary.

Electrical connections, nine outlets, each for a 60 watt lamp.

Shipping weight, 672 pounds.

16. Heroes of Medicine.

An exhibit, originally shown at the Golden Gate International Exposition in San Francisco, consisting of ten groups of figures—McDowell, Beaumont, Long, Holmes, Sims, Welch, Gorgas, Theobald Smith, Ricketts and Reed. Each group is set in a case with indirect lighting. Models are made of rubber and are quite substantial.

Space required, area 10 feet wide by 10 feet deep (or 21 linear feet).

Electrical connections, ten outlets using a total of 400 watts.

Shipping weight, 840 pounds.

30. Hospital Service in the United States.

An exhibit from the Council on Medical Education and Hospitals presenting data on hospitals collected in the annual survey; miscellaneous posters and pamphlets.

Space required, one or two booths according to material selected, together with tables for literature.

Shipping weight, according to material selected.

32. Medical Education in the United States.

An exhibit from the Council on Medical Education and Hospitals consisting of charts showing statistics on medical education in the United States, together with miscellaneous maps and literature.

Space required and shipping weight, according to amount of material selected.

34. Tularemia (spread and control).

An exhibit from the Scientific Exhibit of the American Medical Association made in conjunction with Dr. Walter M. Simpson, Miami Valley Hospital, Dayton, Ohio, and Dr. Edward Francis, U. S. Public Health Service, Washington, D. C., consisting of transparencies showing clinical cases of tularemia and posters on panels showing the prevalence, animal hosts, insect vectors and what to do to prevent infection. An exposition "microscope" shows the tularemia organism.

Space required, an area 10 feet wide by 6 feet deep; no background necessary.

Electrical connections, two outlets for lamps in transparency case and exposition "microscope" using 255 watts.

Shipping weight, 297 pounds.

35. Tularemia (pathology).

An exhibit from the Scientific Exhibit of the American Medical Association of photographs, photomicrographs and roentgenograms collected by Dr. Walter M. Simpson and Dr. Edward Francis, showing the pathologic changes of tularemia in animals and man.

Space required, an area 10 feet wide by 6 feet deep; no background necessary.

Electrical connections, one outlet for lamps in transparency case using 240 watts.

Shipping weight, 260 pounds.

50. Use and Abuse of Barbiturates.

An exhibit from the Council on Pharmacy and Chemistry consisting of posters showing the use and abuse of the barbiturates; a chart giving the names and chemical formulas of thirty products on the market; an exposition file and New and Nonofficial Remedies giving additional information.

Space required, a booth with back wall 10 feet wide and side walls 6 feet deep on which to hang charts and posters; a table for exposition file and N. N. R.

Shipping weight, 103 pounds.

51. Work of the Council on Pharmacy and Chemistry.

An exhibit from the Council on Pharmacy and Chemistry consisting of miscellaneous posters, each 22 by 28 inches, from which selections can be made to fit any space desired.

Shipping weight, from 40 to 50 pounds.

52. Work of the A. M. A. Chemical Laboratory.

An exhibit from the Chemical Laboratory, similar to the one from the Council on Pharmacy and Chemistry, consisting of posters from which selections can be made to fit any space desired.

Shipping weight, from 40 to 50 pounds.

53. Work of the Council on Foods and Nutrition.

An exhibit from the Council on Foods and Nutrition consisting of miscellaneous posters, each 22 by 28 inches, containing the various items of information concerning the work of the Council.

Shipping weight, according to amount of material selected.

54. Work of the Council on Physical Therapy.

An exhibit from the Council on Physical Therapy consisting of miscellaneous charts in frames, each 22 by 28 inches, together with selected apparatus. The following groups have been found of interest: short wave diathermy; simple apparatus for physical therapy; miscellaneous posters dealing with the work of the Council.

Space required, variable according to kind of material selected.

Electrical connections, one or more outlets if mechanical material is selected.

Shipping weight, variable according to material selected.

55. Posture.

An exhibit from the Council on Physical Therapy consisting of a manikin for visitor participation showing correct and incorrect posture; transparencies showing reasons for good

posture and panels with posters showing the relation of sitting and posture, the feet and posture, the causes of poor posture and recommendations for good posture. An exposition file gives additional information.

Space required, an area 10 feet wide by 6 feet deep; no background necessary; two small tables, one for manikin and one for exposition file.

Electrical connections, three outlets for lamps in cases using a total of 440 watts.

Shipping weight, 368 pounds.

61. Medical Economics.

An exhibit from the Bureau of Medical Economics consisting of miscellaneous charts; a rack for literature showing the publications of the Bureau and two exposition files containing various items of information concerning medical economics.

Space required, a booth with back wall 10 feet wide and two side walls each 6 feet deep.

Shipping weight, 240 pounds.

63. Industrial Health.

An exhibit from the Council on Industrial Health consisting of a group of posters showing the status of industrial health in the United States together with an exposition file giving additional information.

Space required, a booth with back wall 10 feet wide and side walls on which to hang posters; table for exposition file.

Shipping weight, 166 pounds.

64. Silicosis and Pneumoconiosis.

An exhibit from the Council on Industrial Health in conjunction with the Saranac Laboratory consisting of transparencies and panels showing the essential facts about benign pneumoconiosis, simple nodular silicosis, simple conglomerate silicosis, tuberculosilicosis and asbestosis.

Space required, an area 30 feet wide by 6 feet deep; no background necessary.

Electrical requirements, five outlets for transparencies, alternating current, 400 watts.

Shipping weight, 991 pounds.

66. Basic Science Laws.

An exhibit from the Bureau of Legal Medicine and Legislation consisting of six charts and frames, each 22 by 28 inches, together with a shadow box.

Space required, a booth with back wall 10 feet wide, and side walls 6 feet deep (15 linear feet).

Electrical connections, one outlet, 120 watts.

Shipping weight, 154 pounds.

67. Medical Legislation and Medicolegal Topics.

An exhibit from the Bureau of Legal Medicine and Legislation consisting of miscellaneous charts in frames, each 22 by 28 inches.

Space required, a booth with back wall 10 feet wide and side walls 6 feet deep (or 15 linear feet).

Shipping weight, 60 pounds.

70. Cutaneous Manifestations of Tuberculosis.

An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of four panels each 5 feet high and 3 feet wide, showing photographs of cutaneous tuberculosis and conditions which simulate it.

Space required, an area 10 feet wide by 3 feet deep; no background necessary.

Shipping weight, 166 pounds.

71. Cutaneous Granulomas.

An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of photographs of various granulomas (other than tuberculosis and syphilis), including one panel of leprosy and one panel of drugs. The photographs are mounted on six panels, each 5 feet high and 3 feet wide, with legs 2½ feet high, which can be installed readily.

Space required, an area 12 feet wide by 3 feet deep; no background necessary.

Shipping weight, 250 pounds.

72. Cutaneous Manifestations of Syphilis.

An exhibit from the Scientific Exhibit of the American Medical Association, in conjunction with the Section on Dermatology and Syphilology, consisting of about 150 photographs of the various syphilitic lesions in different stages of the disease. The photographs are mounted on panels 5 feet high by 3 feet wide, with legs 2½ feet high, which can be installed readily.

Space required, an area 18 feet wide by 3 feet deep; no background necessary.

Shipping weight, 327 pounds.

78. Aesculapius, Hygeia, Hippocrates and Osler.

Four plaster plaques in bas-relief from the Bureau of Exhibits showing Aesculapius, Hygeia, Hippocrates and Osler. Each figure is 8½ feet high, 3 feet wide and 6 inches thick. Because of the fragile nature of the plaques, they will be sent only where they can be suitably installed.

Shipping weight: Aesculapius, 343 pounds; Hygeia, 354 pounds; Hippocrates, 300 pounds, and Osler, 366 pounds.

82. Treatment of Early Syphilis.

An exhibit prepared in conjunction with the United States Public Health Service consisting of ten posters, each 22 by 28 inches, together with an exposition file containing various items of information about the treatment of early syphilis. (A duplicate of this exhibit can be obtained also from the United States Public Health Service, Washington, D. C.)

Space required, a booth with back wall 10 feet wide and side walls 6 feet deep.

Shipping weight, 125 pounds.

84. Treatment of Prenatal Syphilis.

An exhibit prepared in conjunction with the United States Public Health Service, consisting of ten posters, each 22 by 28 inches, together with an exposition file containing various items of information about the treatment of prenatal syphilis. (A duplicate of this exhibit can be obtained also from the United States Public Health Service, Washington, D. C.)

Space required, a booth with back wall 10 feet wide and side walls 6 feet deep.

Shipping weight, 81 pounds.

86. Treatment of Late and Latent Syphilis.

An exhibit prepared in conjunction with the United States Public Health Service, consisting of ten posters, each 22 by 28 inches, together with an exposition file containing various items of information about the treatment of late and latent syphilis. (A duplicate of this exhibit can be obtained also from the United States Public Health Service, Washington, D. C.)

Space required, a booth with back wall 10 feet wide and side walls 6 feet deep.

Shipping weight, 119 pounds.

91. *Hygeia* in Office, School and Home.

An exhibit prepared in conjunction with *Hygeia*, the Health Magazine, consisting of five dioramas showing the use of *Hygeia* in office, school and home.

Space required, an area 10 feet wide by 3 feet deep; no background necessary.

Electrical connections, five outlets, requiring a total of 300 watts.

Shipping weight, 250 pounds.

95. Anesthesia.

An exhibit from the Scientific Exhibit of the American Medical Association, consisting of charts, transparencies and an exposition file giving information concerning anesthesia.

Space required, a booth with back wall 10 feet wide and side walls 6 feet deep.

Electrical requirements, one outlet using 240 watts.

Shipping weight, 267 pounds.

OFFICIAL NOTES

THIRD ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Arrangements have been completed for the third annual Congress on Industrial Health sponsored by the American Medical Association, which will be held Monday and Tuesday, Jan. 13 and 14, 1941, at the Palmer House in Chicago.

These meetings are open to all physicians and others interested in the industrial health movement. There is no registration fee.

Topics and speakers are as follows:

OPENING SESSION, MONDAY, 9:45 A. M.

Report of the Council on Industrial Health.
STANLEY J. SEEGER, M.D., Chairman, Milwaukee.

The Physician in Industry and National Defense.
IRVIN ABELL, M.D., Chairman, Health and Medical Committee in the Council of National Defense, Louisville, Ky.

Current Needs in Industrial Hygiene Research.
PHILIP DRINKER, Professor of Industrial Hygiene, Harvard University, Boston.

The Special Nature of Industrial Practice.
C. O. SAPPINGTON, M.D., Chicago.

Disability Evaluation in Silicosis.
J. L. BLAISDELL, M.D., Porcupine Clinic for Silicosis Research, St. Mary's Hospital, Timmins, Ontario.

Red Lacquer Room

MONDAY, 2 P. M.

HAND INJURIES

Anatomic Diagnosis of Injuries of the Hand.
JAMES M. WINFIELD, M.D., Associate Professor of Surgery, Wayne University College of Medicine, Detroit.

Treatment of Superficial Hand Injuries and Burns.
HARVEY S. ALLEN, M.D., Chicago.

Division of the Nerves and Tendons of the Hand.
MICHAEL MASON, M.D., Chicago.

Importance of Purposeful Splinting Following Injuries of the Hand.
HENRY C. MARBLE, M.D., Boston.

Prevention and Treatment of Hand Infections.
SUMNER L. KOCH, M.D., Chicago.

Red Lacquer Room

MONDAY, 2:30 P. M.

AVAILABILITY OF TRAINED INDUSTRIAL HEALTH PERSONNEL

The Trained Industrial Nurse.
RUTH HOULTON, R.N., Secretary, Industrial Nursing Section, National Organization for Public Health Nursing, New York.

The Industrial Hygiene Engineer.
(Speaker to be announced.)

The Safety Engineer.
W. H. CAMERON, Managing Director, National Safety Council, Inc., Chicago.

The Medical Industrial Hygienist.
PAUL A. NEAL, M.D., Chief of the Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Bethesda, Md.

The Physician in Industry.
ROBERT T. LEGGE, M.D., University of California, Berkeley, Calif.

Room 8

MONDAY, 6:30 P. M.

An informal dinner and round table discussion intended primarily for state and county medical society committees on industrial health will be held. The subject matter for discussion will include problems of organization and plans for future activity.

TUESDAY, 9:30 A. M.

Employment of the Physically Handicapped.
D. L. LYNCH, M.D., President, American Association of Industrial Physicians and Surgeons, Boston.

Aging as a Problem of Industrial Health.
EDWARD J. STIEGLITZ, M.D., Research Associate in Gerontology, National Institute of Health, U. S. Public Health Service, Bethesda, Md.

ACUTE RESPIRATORY DISEASE IN INDUSTRY

Incidence and Costs of Acute Respiratory Disease in Industry.
ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York.

Respiratory Disease and Air Conditioning.
CAREY P. MCCORD, M.D., Chairman, Committee on Air Conditioning of the American Medical Association, Detroit.

The Role of the Physician in Industry in the Control of Acute Respiratory Disease.
GEORGE M. PIERSOL, M.D., Philadelphia.

Red Lacquer Room

TUESDAY, 2 P. M.

INDUSTRIAL OPHTHALMOLOGY

Economic Importance of Visual Disability in Industry.
LEONARD GREENBURG, M.D., Chairman, Industrial Advisory Committee of the National Society for the Prevention of Blindness, New York.

Essentials of First Aid and Later Management of Industrial Eye Injuries.
SIDNEY WALKER JR., M.D., Chicago.

Detection and Control of Defective Vision in Industry.
ARTHUR M. CULLER, M.D., Dayton, Ohio.

Protective Equipment for Eyes in Industry.
THOMAS D. ALLEN, M.D., Associate Clinical Professor of Ophthalmology at Rush Medical College, Chicago.
HENRY F. CARMAN, M.D., San Francisco.

Red Lacquer Room

WEDNESDAY, JANUARY 15

On the day following the congress, the Chicago Medical Society will conduct clinics illustrating practical problems in industrial medicine, industrial hygiene and traumatic surgery.

On the same day the Chicago Medical Society will hold a dinner and evening meeting on the relationship of the private practitioner to the industrial health movement. The program will be:

Industrial Health—A Medical Opportunity.
STANLEY J. SEEGER, M.D., Chairman, Council on Industrial Health, American Medical Association, Milwaukee.

Medical Service for the Small Plant.
ANTHONY J. LANZA, M.D., New York.

The Control of Syphilis in Industry.
HAROLD A. VONACHEN, M.D., Peoria, Ill.

Further details regarding clinics and other demonstrations will be provided registrants at the congress, all of whom are invited to participate.

RADIO BROADCASTS

"Doctors at Work" is the title of the sixth annual series of dramatized radio programs being presented by the American Medical Association and the National Broadcasting Company.

The series opened Wednesday, November 13, and will run for thirty consecutive weeks, closing with a broadcast from the annual session at Cleveland on June 3, 1941. The program is scheduled for 10:30 p. m. eastern standard time (9:30 central, 8:30 mountain, 7:30 Pacific time) over the Blue network, other N. B. C. stations and Canadian stations.

These programs are broadcast on what is known in radio as a sustaining basis; that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the programs, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The programs will dramatize what modern medicine offers the individual in the way of opportunities for better health and the more successful treatment of disease. Incidental to this main theme the programs will explain the characteristics of the different fields of modern medicine and its specialties.

Descriptive posters for local distribution may be had gratis from the Bureau of Health Education, American Medical Association, 535 North Dearborn Street, Chicago. Program titles will be announced weekly in THE JOURNAL and monthly in *Hygeia*, the Health Magazine.

Tickets are available for each broadcast. Address the Bureau of Health Education, American Medical Association, 535 North Dearborn Street, Chicago. Tickets are free, but a stamped self-addressed envelop should accompany requests.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

November 27. Through Hospital Corridors.
December 4. Paging Doctor Drew.
December 11. The Family's First Friend.

WOMAN'S AUXILIARY

Kansas

Members of the Montgomery County Medical Society and their wives met at the country club at Cherryvale, September 29, for a picnic supper. While the doctors enjoyed golf and target shooting the wives enthusiastically decided to become active in auxiliary work. Dr. and Mrs. Charles Miller were guests, and Mrs. Miller, who is councilor of the third district, presented objectives of the auxiliary today. Dr. and Mrs. T. D. Blasdel of Parsons were also guests, and Mrs. Blasdel, president of the auxiliary to the state society, suggested plans for the year. Mrs. H. O. Bullock of Independence was elected president and a meeting date was set at which time other officers will be elected and committees appointed.

Mississippi

The doctors' wives of Monroe County entertained the visiting auxiliary members of the Northeast Mississippi Thirteen Counties' Medical Society, September 10, at the home of Mrs. W. N. Reed. Mrs. Bernard Patrick, the president, introduced the speaker, Dr. Augustus Street, of Vicksburg, president-elect of the Mississippi State Medical Association. Mrs. Augustus Street urged the auxiliary's liberal offering for the Preventorium Fund. Mrs. Stanley Hill, of Corinth, gave a paper on "Animal Experimentation."

Members of the Adams County auxiliary and their husbands were entertained, October 2, at the home of Dr. and Mrs. W. K. Stowers, Natchez. Dr. E. E. Benoist, master of ceremonies, presented Dr. W. H. Anderson, Boonerville, president of the Mississippi State Medical Association, and Mrs. E. C. Parker, Gulfport, president of the woman's auxiliary to the state medical association. Dr. Anderson urged the wives to study ways of helping improve the service their husbands offer, to welcome opportunities of imparting information to the laity and thus strengthen confidence in the profession, and to strive to be the leaders in work related to medicine.

The officers of the state auxiliary met, October 3, with Mrs. Henry Boswell at the preventorium. The group voted $30 a month to keep two children at the preventorium.

Nebraska

The auxiliary to the Lancaster County Medical Society met, October 7, at the home of Mrs. Floyd Rogers of Lincoln. Prof. O. H. Bimson, of Lincoln High School, talked on his experiences as a member of the Educational Policies Commission and the American Youth Commission.

The auxiliary to the Omaha-Douglas Counties Medical Society held a Harvest Home Benefit Dinner, October 9, at the summer residence of Dr. and Mrs. C. C. Tomlinson. Proceeds from the dinner will benefit the projects adopted at the recent Membership Tea; namely, a subscription to *Hygeia* to all 102 of Omaha's public and parochial schools, the Community Chest, the School Free Lunch Fund and the Nebraska Tuberculosis Health Camp.

A joint dinner meeting of the tri-county auxiliary No. 1 and the Tri-County Medical Society was held, September 26, at the St. Francis Hospital in Grand Island. Mrs. Elmer Hansen, Lincoln, spoke on auxiliary problems; Mrs. J. G. Woodin, president of the auxiliary, talked on "A Look Ahead." Mrs. A. D. Brown, Central City, state president, addressed the group.

Oregon

The woman's auxiliary to the Oregon State Medical Society held its fourteenth annual meeting, September 5, at Eugene with seventy members in attendance. Mrs. V. E. Holcombe, president of the woman's auxiliary to the American Medical Association, was guest of honor. Dr. Hans Lisser, clinical professor of medicine at the University of California Medical School, spoke on "Hypothyroidism," with colored motion picture demonstrations.

Officers for the coming year were installed at the closing session: Mrs. Charles Edwin Sears, Portland, president; Mrs. Charles Hunt, Eugene, president-elect; Mrs. Merle Taylor, Portland, corresponding secretary; Mrs. Laurence Serrurier, Portland, recording secretary, and Mrs. Paul Lind, Portland, treasurer.

Mrs. Holcombe attended the board meeting of the auxiliary to the Multnomah County Medical Society, September 9, and was guest of honor at a luncheon held at the Town Club. Twenty-six members attended. The auxiliary began its fall activities with a meeting, September 23, at the Portland Golf Club, with forty members present. This is a social occasion each year with bridge and visiting after luncheon.

Six volunteers from the auxiliary assisted with the annual open house and tea, October 5, at the Louise Home for Girls, a charitable organization. Members also assisted with the Silver Tea at Doernbecker Hospital for crippled children, September 21. The auxiliary to the Coos-Curry Counties Medical Society reports that at its first meeting in September the members worked on garments for the county poor farm.

Pennsylvania

The auxiliary honored its medical advisers at luncheon and heard an important lecture on "The World to Come" by Maurice Hindus, a journalist. Entertainment comprised a bus trip to Atlantic City for guests, music and talks by prominent speakers.

The annual meeting of the woman's auxiliary to the Medical Society of the State of Pennsylvania met in Philadelphia with more than 400 members in attendance. Mrs. V. E. Holcombe, president of the national auxiliary, was a guest. From the reports of the committees, it was found that during the current auxiliary year over $5,500 had been contributed to the Benevolence Fund, Pennsylvania's own plan for caring for needy medical men and their families, contributed to by county groups each year. The auxiliary has contributed over $37,000 to the fund in the past ten years. Pennsylvania, while not holding its place in national *Hygeia* sales, still did considerable work in that field. The state has followed the program of the national auxiliary and has reached over 5,000 in lay groups with public relation programs. The state auxiliary has a balance of over $1,600 this year after all bills have been met. The history of the work of the state auxiliary in book form being made by the archives chairman is nearly completed. Twenty counties had model exhibits of original design showing their work in their home fields.

The woman's auxiliary to the Philadelphia County Medical Society began the season with the meeting of the state medical society in Philadelphia, followed by a meeting, October 8. Dr. Edward L. Bortz, president, Philadelphia County Medical Society, regards the work of organized medicine as a function of the auxiliary. He offered to provide physicians to report on the affairs of the county and suggested the ways and means by which the auxiliary might be most helpful. The health education chairman, Mrs. M. Fraser Percival, is ready to place speakers from the bureau of the Philadelphia County Medical Society before clubs.

South Carolina

Mrs. Charles P. Corn, president of the auxiliary to the Southern Medical Association, spoke at the September meeting of the auxiliary to the Greenville County Medical Society. She reported that members in Virginia and North Carolina have endowed beds for tuberculous patients in two sanatoriums. They are memorial beds in which members of doctors' families are given preference. In Alabama the auxiliary maintains a student loan fund.

The auxiliary to the Oconee County Medical Society recently purchased for the library of the Oconee County Hospital an aid for doctors who wish to find references in the medical books placed in the library by the Oconee County Medical Society. Guest speaker at the recent meeting was Dr. E. A. Hines, secretary of the South Carolina Medical Association.

The Spartanburg county medical auxiliary met recently, with Mrs. Charles P. Corn of Greenville, president of the Woman's Auxiliary to the Southern Medical Association, as guest speaker. Another guest was Dr. Ruth Frank Pugh of Converse College.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Hugh F. Dormody, Monterey, was recently elected governor of district 106 of the Rotary International. ——Dr. Lee A. Stone, Madera, was elected president of the health officers' department of the League of California Cities at a meeting, September 18, in San Diego.

Program for Pertussis Immunization Proposed.—The San Francisco Department of Health is planning to establish an immunization program against pertussis in a baby welfare center located in a section of the city where economic conditions generally prohibit a given family from securing this service from its private physician. After a trial period the program may be extended to other centers operated by the department if conditions show a need for the service and the experience of the trial station justifies its expansion. While no funds are now available in the present fiscal budget, it is hoped that a sufficient amount will be obtained to launch this work. It was pointed out that the cost of the material alone to the department for one pertussis immunization is eight times the cost of the material used for a complete immunization against diphtheria. The change was planned after the present policy of the department with respect to pertussis immunization was reviewed. Before a decision was made, opinions were requested from some pediatricians in the city and professors in this specialty at the medical schools of Stanford and California universities.

FLORIDA

Fraudulent Licenses Appear.—Two licenses recorded with the state board of medical examiners were recently declared fraudulent and are, according to the board, indications that the diploma mill racket is again being revived. One license, recorded by Lyle Park Johnson last April, was purportedly issued by the old Eclectic Board of Medical Examiners in 1919. Until recently Johnson had been practicing as a naturopath. The other license was recorded in Munroe County in September 1939 by Gavilla Lopez and was also an eclectic license purportedly issued in 1919. Lopez had also been practicing as a naturopath in Tampa. Both men possessed diplomas from the Baltimore Eclectic Medical College, the state medical board reported.

ILLINOIS

Society News.—Dr. Harold C. Lueth, Evanston, discussed "Management of Bright's Disease with Special Reference to the Acute Stage" before the Adams County Medical Society in Quincy, October 14. —— Dr. George K. Fenn, Chicago, addressed the Madison County Medical Society in Granite City, November 1, on congestive heart failure. —— Dr. Walter C. Alvarez, Rochester, Minn., discussed "Functional Gastrointestinal Disorders" before the Peoria Medical Society, November 12.——The Tri-County Medical Society, comprising Warren, Knox and Henry counties, met in Monmouth, November 1, with the following speakers: Drs. Charles E. Galloway, Evanston, on "Diseases of the Cervix and Treatment"; Chauncey C. Maher, "Treatment of Cardiac Edema"; Philip Lewin, "Infantile Paralysis," and Morris Fishbein, Editor of THE JOURNAL, "The Medical Profession Prepares." All are of Chicago.——Dr. Wayne W. Fox, Evanston, addressed the Christian County Medical Society at Taylorville, October 30, on pneumonia. —— Dr. Richard S. Weiss, St. Louis, discussed "Precancerous Lesions of the Skin" before the St. Clair County Medical Society in Belleville, November 6. —— Dr. Paul A. Campbell, Chicago, discussed "Medical Problems of Combat Aviation" before the La Salle County Medical Society, October 24, at Starved Rock State Park.

Chicago

Winners of Child Research Grant. — The Institute of Medicine of Chicago announces that the Elizabeth McCormick Child Research Grant of $1,500 for 1940-1941 has been divided among Drs. Mila I. Pierce, Evanston, Clayton J. Lundy and Heyworth N. Sanford for the continuation of the investigations begun under their 1939-1940 grants. Dr. Lundy's subject is heart sound records in rheumatic heart disease; Dr. Pierce's, leukosis, and Dr. Sanford's, role of qualitative platelet factors in the coagulation of the blood.

Symposium on the Adult Offender.—The Chicago Academy of Criminology and the Chicago Society for Personality Study held a joint meeting, October 30. The theme of the session was "The Adult Offender." The speakers included:

Dr. Marvin Sukov, psychiatrist, division of the criminologist, State of Illinois, Personality Study of the Adult Offender.
Hans Riemer, supervisor of education, Indiana State Penitentiary, Practical Application in a Prison Program.
Samuel Daykin, sociologist, division of pardons and paroles, State of Illinois, Practical Application in Probation, Parole and Social Readjustments.

Harry M. Fisher, judge of Cook County Circuit Court, and Ernst W. Puttkammer, professor of law, University of Chicago, discussed the presentations.

INDIANA

Society News.—Dr. Jay Arthur Myers, Minneapolis, discussed "The Control of Tuberculosis" before the Fort Wayne Medical Society in Fort Wayne, October 15.——The Delaware-Blackford County Medical Society was addressed in Muncie, October 15, by Drs. Joseph C. Silvers and Nila G. K. Covalt, Muncie, on "Organotherapy of Menstrual Irregularities" and "Organotherapy of the Menopause" respectively.——Dr. Daniel L. Sexton, St. Louis, addressed the Gibson County Medical Society in Princeton, October 14, on "Endocrine Treatment in General Practice."——Dr. Eugene L. Bulson, Fort Wayne, discussed "The Symptoms and Diagnosis of Foreign Bodies in the Air and Food Passages" before the Fort Wayne Academy of Medicine and Surgery, November 12. The academy was addressed, November 19, by Dr. Grover C. Penberthy, Detroit, on "The Surgical Management of Appendicitis."

KANSAS

Changes in Health Officers. — Dr. Hugh M. Swaney, Goodland, has been named health officer of Sherman County. Dr. Charles A. Dieter, Harper, has been appointed in charge of Harper County to succeed the late Dr. Clarence E. Ressler, Anthony, and Dr. James N. Hill, Hutchinson, health officer of Reno County.

Society News.—The Shawnee County Medical Society was addressed, November 4, by Dr. Andrew W. McAlester III, Kansas City, Mo., on "Practical Ophthalmic Therapy."—— Dr. Henry M. Winans, Dallas, Texas, discussed "Anemia—Diagnosis of Difficult Cases" before the Wyandotte County Medical Society, November 5, in Kansas City. The society was addressed, October 15, by Drs. Albert J. Rettenmaier on "Biliary Stones with Emphasis on the Exploration of the Common Duct" and Harold V. Holter, "Sterility."

MASSACHUSETTS

Petition Supports Contraceptive Advice. — The Committee for the Defense of Medical Rights has issued a statement in support of an initiative petition to amend the Massachusetts laws relating to prevention of pregnancy. The change in the law would allow physicians to provide medical contraceptive information and care to married persons for the protection of life or health. The petition asks the legislature to amend sections 20 and 21 of chapter 272 of the general laws by adding at the end thereof the following:

> The provisions of this section and of section twenty which relate to the prevention of pregnancy and the prevention of conception shall not apply to treatment or prescription given to married persons for protection of life or health by or under the direction of physicians registered in accordance with the provisions of Chapter 112; nor to teaching in chartered medical schools; nor to publication or sale of medical treatises or journals.

The statement issued by the Committee for the Defense of Medical Rights reads:

> The initiative petition proposed is for a bill to insure to physicians the right to protect the life, health, and reason of married persons when these might be endangered by pregnancy. It is designed to prevent the legal interference with this phase of the practice of medicine, which has only recently resulted from the enforcement of an old Massachusetts statute.
>
> The principle of legal freedom for physicians to provide contraceptive medical care to married persons whose physical or mental condition would suffer by pregnancy or who could be expected to produce only seriously defective individuals, has been approved by the American Medical Association, and by many other medical and religious bodies.
>
> Support of this petition does not imply support of either the methods or philosophy of "birth control." It means only support of the principle of freedom in the licensed teaching and practice of medicine.
>
> The initiative petition is so designed as to protect morality and marital security and to bring under licensed control the present, widespread bootleg traffic in contraceptive information and material, which we deplore.

Physicians who wish to aid in obtaining signatures to the initiative petition may obtain blanks by getting in touch with Somers H. Sturgis, secretary of the Committee for the Defense of Medical Rights, 270 Commonwealth Avenue, Boston.

NEW YORK

Society News.—Willard H. Wright, Ph.D., Washington, D. C., addressed the Buffalo Academy of Medicine, October 30, on "Common Parasitic Infestations in Children." Dr. Jacob Arnold Bargen, Rochester, Minn., addressed the section of surgery, November 6, on "Differentiation Between Various Types of Ulcerative Colitis and Their Management."——Dr. Harry Dan Vickers, Little Falls, addressed the Herkimer County Medical Society, October 8, on "Surgical Aspects of a Major Railroad Accident."——Dr. William P. van Wagenen, Rochester, addressed the Jefferson County Medical Society, October 10, on "Head Injuries."——Clarence Cook Little, Sc.D., Bar Harbor, Maine, and Dr. William P. Healy, New York, addressed the Medical Society of the County of Nassau, Garden City, October 29, on "Recent Advances in Cancer Research" and "Cancer of the Female Pelvis" respectively.

New York City

Second Harvey Lecture.—Dr. Charles H. Best, Toronto, Canada, will deliver the second Harvey Society Lecture of the current series at the New York Academy of Medicine, November 28. Dr. Best's subject will be "Thrombosis and the Action of Heparin."

Lecture by Dr. Corner.—Dr. George W. Corner, director of the department of embryology of the Carnegie Institution of Washington, located in Baltimore, will deliver a lecture at Cornell University Medical College, December 10, under the auspices of the Nu Sigma Nu Fraternity. Dr. Corner's subject will be "The Ovarian Cycle of the Rhesus Monkey."

OHIO

Personal.—Dr. Joseph J. Kotershall, Cleveland, was recently honored at a surprise dinner given by about seventy-five physicians. It was said that the dinner was in appreciation of "the guiding hand he has always offered to youngsters in the profession." The group gave him a watch as a memento.

University News.—The General Education Fund has recently added $12,700 to the grant previously made to the Brush Foundation, Western Reserve University School of Medicine, Cleveland, for the study of child health and development under the direction of William Walter Greulich, Ph.D., director of the foundation.

Postgraduate Lectures.—The autumn postgraduate series of lectures sponsored by the Mahoning County Medical Society were presented in Youngstown, November 14-15, with Dr. Henry L. Bockus, Philadelphia, as the speaker. His subjects were "Present Clinical Status of Chronic Gastritis," "What Constitutes Adequate Therapy for Chronic Peptic Ulcer," "Practical Application of Recent Advances in Our Knowledge of Liver Functions," "Diagnosis and Management of Chronic Ileitis and Ileocolitis" and "Diagnosis and Management of the 'Irritable Colon.'"

PENNSYLVANIA

Postgraduate Assembly.—The Harrisburg Academy of Medicine presented its annual Postgraduate Assembly, November 14, with the following speakers:

Dr. Frederick S. Wetherell, Syracuse, N. Y., The Nodular Goiter—Its Inherent Dangers.
Dr. William Blair Mosser, Kane, Problems in the Diagnosis and Treatment of Hyperthyroidism.
Dr. Chevalier L. Jackson, Philadelphia, Broncho-Esophagology in Relation to General Medicine.
Dr. Temple S. Fay, Philadelphia, Further Observations on Refrigeration in Human Beings.

Philadelphia

Personal.—Dr. Frederick C. Smith has been elected editor of the *Weekly Roster and Medical Digest*, official organ of the Philadelphia County Medical Society, to succeed the late Dr. Samuel Horton Brown.

Joint Orthopedic Meeting.—The section of orthopedic surgery of the New York Academy of Medicine and the orthopedic section of the Philadelphia County Medical Society held a joint meeting at Jefferson Medical College, November 15. The speakers included:

Dr. James R. Martin, A Simplified Apparatus for Use After Surgery for Torticollis.
Dr. Arthur Bruce Gill, Early Changes in Legg-Perthes' Disease and the Cyclic Course It Pursues.
Dr. Oscar V. Batson, The Vertebral Venous System.
Drs. Ernest A. Brav and Henry I. Sigmond, Injection Treatment for Low Back and Sciatic Pain.
Drs. Benjamin Franklin Buzby and Allan D. Wallis, Spine Fusion—A Modified Hibbs Technic.

RHODE ISLAND

Society News.—At a meeting of the Providence Medical Association, October 7, Drs. Halsey DeWolf, chairman of the state board on medical preparedness, and Lloyd C. Wilson, medical director, state selective service board, spoke on medical preparedness. A symposium on tuberculosis was presented by Drs. Philip Batchelder, Joseph Smith, John I. Pinckney, John C. Ham, Providence, and Ubaldo E. Zambarano, Wallum Lake. Dr. Joseph V. Meigs, Boston, spoke, November 4, on "Female Endocrinology."

TENNESSEE

Chattanooga Clinical Congress.—The Chattanooga and Hamilton County Medical Society held its annual clinical congress October 31. The program of clinics was presented at the Newell Sanitarium in the morning and at the Erlanger Hospital in the afternoon. A banquet was held at the Hotel Patten in the evening with Drs. John Shelton Horsley, Richmond, Va., and Seale Harris, Birmingham, Ala., as the speakers on gastrointestinal surgery, including appendicitis, and "Insulin Jitters" respectively.

TEXAS

Appointments to Medical Faculty.—Dr. John J. Lawless, recently assistant professor of anatomy at the University of West Virginia School of Medicine, Morgantown, has been appointed assistant professor of anatomy at the University of Texas School of Medicine, Galveston. Dr. Lawless took a Ph.D. degree from the University of Minnesota in 1934 and an M.D. from Rush Medical College in 1939. He previously held a teaching fellowship at the University of Minnesota and an instructorship at Georgetown University, Washington, D. C. J. K. Kline, Ph.D., formerly research chemist with Merck and Company and the Bell Telephone Laboratories, has been appointed assistant professor in pharmacology, with special assignments in the department of preventive medicine and public health.

Annual Postgraduate Assembly.—The Postgraduate Medical Assembly of South Texas will hold its ninth annual clinical meeting, December 3-5, at the Rice Hotel, Houston. This meeting is a project of the eighth, ninth and tenth councilor districts of the State Medical Association of Texas. The speakers will be:

Dr. Horton R. Casparis, professor of pediatrics, Vanderbilt University School of Medicine, Nashville, Tenn.
Dr. Milton B. Cohen, director of the Asthma, Hay Fever and Allergy Foundation, Cleveland.
Dr. Claude C. Coleman, clinical professor of neurologic surgery, University of Virginia Department of Medicine, Charlottesville, and professor of neurologic surgery, Medical College of Virginia, Richmond.
Dr. James B. Costen, assistant professor of clinical otolaryngology, Washington University School of Medicine, St. Louis.
Dr. David M. Davis, professor of genito-urinary surgery, Jefferson Medical College, Philadelphia.
Dr. Charles C. Dennie, Kansas City, Mo., professor of clinical dermatology, University of Kansas School of Medicine, Kansas City.
Dr. John H. Dunnington, professor of ophthalmology, Columbia University College of Physicians and Surgeons, New York.
Dr. Sanford R. Gifford, professor of ophthalmology, Northwestern University Medical School, Chicago.
Dr. Byrl R. Kirklin, director, division of radiology, Mayo Foundation, Rochester, Minn.
Dr. Earl D. McBride, assistant professor of orthopedic surgery, University of Oklahoma School of Medicine, Oklahoma City.
Dr. Henry K. Mohler, dean and Sutherland M. Prevost professor of therapeutics, Jefferson Medical College, Philadelphia.
Dr. George Morris Piersol, professor of medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia.
Dr. Floyd T. Romberger, Lafayette Home Hospital, Lafayette, Ind.
Dr. Robert A. Ross, associate professor of obstetrics and gynecology, Duke University School of Medicine, Durham, N. C.
Dr. W. Likely Simpson, professor of otology, laryngology and rhinology, University of Tennessee College of Medicine, Memphis.
Dr. Harvey B. Stone, associate professor of surgery, Johns Hopkins University School of Medicine, Baltimore.
Dr. Howard C. Taylor Jr., William Goodell professor of gynecology, University of Pennsylvania School of Medicine, Philadelphia.

WEST VIRGINIA

Personal.—Dr. Maxwell F. Raine, Point Pleasant, district health officer for Mason, Jackson, Putnam and Roane counties, has been appointed health officer of Kanawha County to succeed Dr. Turner E. Cato, who recently went to Florida.

New Officers of Tuberculosis Association.—Dr. Leo H. Mynes, Charleston, was elected president of the West Virginia Tuberculosis and Health Association at the annual meeting in Clarksburg, September 19. Mr. E. P. Wells, field agent for the association, was appointed acting executive secretary to succeed the late George C. Rowell, Charleston, who died September 14.

HAWAII

Outbreak of Influenza. — Under date of October 4, Sr. Surg. Marion F. Haralson, Honolulu, reported to the U. S. Public Health Service an outbreak of influenza in the Territory of Hawaii, principally in Honolulu, with the occurrence of 1,800 cases and two deaths on the Island of Oahu since September 26. On October 13, Dr. Haralson reported a total of 4,298 cases with six deaths. He stated that the disease was of mild type, the cases averaging about three days of acute illness. For the two weeks ended October 19 and 26, respectively, there were 1,532 and 1,585 cases reported with no deaths. For the latter week, 725 cases were reported on the Island of Oahu. Influenza is not reportable in Hawaii except when officially declared to be epidemic, according to *Public Health Reports*.

GENERAL

Conferences on Therapy. — The therapeutic conferences developed at the Cornell University Medical College, New York, and first published as a series of special contributions in THE JOURNAL are to be continued during the present year in the *New York State Journal of Medicine*. The first of the new series will be concerned with the management of fever, the second with the treatment of nephritis. Since similar conferences are being developed in various medical schools, it has been suggested that this material now be published in state medical journals.

National Health Library Moves.—The National Health Library, administered by the National Health Council, announces its removal from the R. C. A. Building, Rockefeller Center, to 1790 Broadway, New York. This library now includes 6,000 volumes and 30,000 pamphlets and receives more than 500 medical and public health periodicals from all parts of the world. Although it is intended primarily for the use of the seventeen health organizations making up the council, individuals who are not members of the supporting organizations may have the privilege of using it for a small fee. A weekly index to the magazines is issued, also available to the public for a small annual subscription.

Jacobi Fellowship for Women Physicians. — The Women's Medical Association of New York offers a Mary Putnam Jacobi Fellowship for medical research of $1,000, available Oct. 1, 1941, open to any woman doctor, either American or foreign, who is a graduate of a reputable medical school. Applications should be filed with the secretary of the committee by March 1, 1941, and must be accompanied by statements by persons other than the candidate as to (1) health, (2) educational qualifications and (3) previous work. The applicant herself should state the problem she proposes to investigate and send her photograph. The recipient will be expected to give full time to the study of her problem and to make a report for publication at the completion of her research. Application blanks may be obtained from the secretary of the committee, Dr. Phebe L. DuBois, 150 East Seventy-Third Street, New York.

Meeting of Radiologists.—The twenty-sixth annual meeting of the Radiological Society of North America will be held at the Hotel Statler, Cleveland, December 2-6. According to a preliminary program, the speakers will include:

Dr. John R. Carty, New York, Soft Tissue Radiography.
Drs. Ernst A. Pohle and Lester W. Paul, Madison, Wis., Mediastinal and Pulmonary Changes in Erythema Nodosum.
Dr. Max M. Peet, Ann Arbor, Mich., Ventriculography and Diagnosis of Brain Tumors.
Dr. William S. Altman, Quincy, Mass., Cholangiography, Fractional Method.
Drs. Walter C. Popp and Charles H. Watkins, Rochester, Minn., Effect of Roentgen Irradiation on Chronic Lymphatic Leukemia.
Drs. Howard P. Doub, Jean P. Pratt and Horace C. Jones, Detroit, Combined Irradiation and Surgery in the Treatment of Carcinoma of the Pelvic Colon.
Dr. Maurice D. Sachs, Portland, Ore., Carcinoma of the Male Breast: A Review of 200 Cases.
Dr. Davis Spangler, Dallas, Texas, Effect of Roentgen Therapy on Closure of the Epiphyses.
Dr. Ira I. Kaplan, New York, Irradiation Therapy of Brain Tumors.

Chinese Hospital Destroyed by Fire. — The Women's Hospital, connected with West China Union University, Chengtu on the Burma Road, was completely destroyed by fire following a Japanese air raid in August, according to a letter from Dr. Sven H. Liljestrand to the Board of Foreign Missions of the Methodist Episcopal Church. The fire destroyed all the cystoscopic and electrotherapeutic apparatus except one cystoscope that had been lent to another hospital unit, as well as all the medical periodicals, Dr. Liljestrand reported. If any physicians are interested in assisting him with second hand apparatus and used copies of journals, they are asked to communicate with the Medical Department, Board of Foreign Missions, Methodist Church, 150 Fifth Avenue, New York. Dr. Liljestrand is a native of New York and graduated from Syracuse University College of Medicine in 1915.

Society News.—Dr. William M. Doughty, Cincinnati, was chosen president-elect of the American Roentgen Ray Society at its annual meeting, October 3, and Dr. Merrill C. Sosman, Boston, was installed as president. The next annual session will be held in Cincinnati, October 6-11. —— At the recent meeting of the Association of Military Surgeons of the United States, Dr. James A. Mattison, Glendora, Calif., was inducted into the presidency. Col. James M. Phalen, U. S. Army, retired, Army Medical Museum, Washington, D. C., is the secretary. Louisville has been selected as the place for the next annual session.——The American Association of the History of Medicine held its first fall meeting in Cleveland, October 7. Among the speakers were Drs. David A. Tucker Jr., Cincinnati, "Daniel Drake, Pioneer Medical Educator of the Middle West"; Logan Clendening, Kansas City, Mo., "Memorials of Medicine in America" and Louis S. Deitchman, Youngstown, Ohio, "Early Medical Printing."

Census of Medical Manufactures.—According to preliminary returns from the census of manufactures for 1939, the value at the factory of surgical instruments and parts made last year was $7,160,692. X-ray and therapeutic apparatus and electronic tubes had a factory value of $17,886,322. Surgical supplies and equipment and orthopedic appliances aggregated $71,679,980.

Statistics are not yet available on the 1939 output of drugs and medicines. In 1937, the value of drugs and medicines as reported by the manufacturers in that year's census was $345,918,343.

Within the surgical supplies industry, a seemingly small item like surgical gut strings alone accounted for $3,673,516 of production. Surgical gauze and dressings totaled $12,510,508. Absorbent cotton production was valued at $3,483,467. Nonmedicated adhesive plasters had a value of $5,946,645, while medicated plasters were produced to the extent of $3,792,159. Bandages amounted to $3,588,637. Sterilizers had a worth of $1,153,680. The remainder of the industry's production is accounted for by items like artificial limbs, trusses, arch supports, surgical belts, and the like.

X-ray apparatus for general medical use had a value at the factory last year of $8,260,750, plus $2,112,942 for x-ray tubes. Ultraviolet health lamps were valued at $1,150,221, while the infra-red totaled $232,445. The value of high-frequency apparatus produced was $1,324,978. Physical therapy equipment totaled $1,378,232. Vibrators and other motor-driven devices were worth $486,713. All other electromedical and electrotherapeutic apparatus, including electrocardiographs, amounted to $1,212,339.

Production of surgical instruments and parts in 1939 was valued at $7,160,692, as compared with $5,830,430 in 1937. Clinical thermometers had a value of $1,575,069. Of the $3,831,225 total for laboratory instruments and apparatus, a substantial amount undoubtedly represents equipment for medical use.

There were fifty establishments primarily engaged last year in the manufacture of surgical and medical instruments, as compared with thirty-nine in 1937. They gave employment to 1,626 wage earners, who received a payroll of $1,978,574. Salaried personnel numbered 319, with earnings of $1,006,020. For materials, supplies, fuel, purchased electrical energy and contract work they spent $2,319,720. In total value of products, they show a gain of 6.4 per cent over 1937.

In the classification of surgical supplies manufacturers, there were 360 plants last year against 323 in 1937. Their 8,468 wage earners received $8,547,630, while salaried personnel numbering 1,967 had earnings of $4,728,519. The industry paid out for materials, supplies and the like $40,296,584. The value of its products rose 3 per cent over 1937.

The manufacture of x-ray and therapeutic apparatus in 1939 occupied eighty-four plants, compared with forty-six in 1937. They had 1,959 wage earners and 692 salaried employees, paying out $2,744,251 in wages and $1,815,337 in salaries. Cost of materials, supplies and the like was $5,754,928. Value of their products increased 4.6 per cent over 1937.

CANADA

The Louis Gross Lecture.—Dr. Emanuel Libman, New York, delivered the third annual Louis Gross Memorial Lecture, November 20, at the Montreal Jewish General Hospital under the auspices of the Montreal Clinical Society. Dr. Libman's subject was "Endocarditis and 'Libman-Sachs' Disease'."

Foreign Letters

LONDON

(From a special correspondent)

Oct. 17, 1940.

An Air Raid in Harley Street

This is a quiet night after two unpleasant ones. I am writing to you in bed in my ground floor back room (which I prefer to the basement, where my family sleeps). I can hear the throbbing hum of an occasional German plane overhead and the quick thud-thud of our antiaircraft guns, but only at odd intervals. We in London have settled down to the queer sort of life we are living and have no intention of leaving it, quite why I don't know, for friends out of London are always urging us (and other people) to leave it, but mostly because one feels that if one leaves London the Germans have got us even that amount down, and we're not having that. The night before last was the first night I have actually got out of bed,

Harley Street in the battle of London. Three houses destroyed, the middle one that of Mr. Sampson Handley, the well known surgeon and authority on cancer. The snapshot shows how little the rest of Harley Street has been affected.

dressed fully, had my (already packed) suitcase handy and told the others downstairs to get their clothes on and prepare to leave the house at a minute's notice: we didn't actually have to, but from my window I could see a house only two away from us (round the corner) blazing away after an incendiary bomb, and another house about four or five the other side has had its back bombed and partly demolished. I thought the flames might reach us but they didn't, for our fire services are very efficient indeed and soon got it under control. I hope the censor allows the snapshot I have enclosed to pass: I took it a week or so ago from my front door and it shows what a bomb did that fell opposite: three houses in dust, like teeth pulled out, and several others badly damaged. You can see from the photograph that that is all the damage (so far) in Harley Street, and there are 152 houses in the street. We always feel that it might have been us or it might be us tonight, but one gets very fatalistic about it all and the casualties are really infinitesimal as compared with the damage done, and even that, though bad enough, is only a flea bite when you look at London as a whole. The population is as determined as ever not to flinch from the blows the Germans are giving us, and we know that we are now hitting them just as hard. I happened to turn the radio tonight by accident to the Bremer station, when the announcer we call "Lord Haw-Haw" (from his affected voice) was talking: his description of the last raid on London I knew from personal observation was perfect nonsense; why he had to exaggerate so ludicrously I can't understand for, of course, they have done some damage quite worth describing from his point of view; apparently he prefers absurd lies to the quite horrid enough truth, as a matter of policy.

I was in a tube (subway) yesterday for the first time for a long time and was much interested to see the quiet underground life that has sprung up among a large section of our population—a life with customs and laws of its own. I was there about 3:30 p. m. and already along the walls, in the subway stations, blankets, suitcases, folding chairs or pillows had been laid down in an orderly manner to reserve places. A few youngsters and old people were already in their places, prepared to stay there until the next morning, about 7 o'clock. Surface shelters have been provided pretty freely in all streets, but thousands of people prefer the comparative discomfort but warmth, light and freedom from noises of gun fire and bombs and the feeling of perfect safety deep down in the passages, stairways and station platforms of our underground railway. The government discouraged it and tried to make rules about it, but the population took matters into their own hands and made their own unwritten but strictly obeyed rules for this sort of thing.

Otherwise things go on as before. My telephone has been off (cables damaged by bombs) for a week, but water, gas and electricity are all right. No signs of shortage of food or any real essentials.

LONDON

(From Our Regular Correspondent)

Oct. 19, 1940.

Should There Be Nurse-Anesthetists?

The Association of Anesthetists has addressed to the chairman of the board of governors of Addenbrooke's Hospital, Cambridge, a letter of protest, signed by the members of the council, who are leading anesthetists, protesting against an advertisement for a nurse to be trained to act as an anesthetist in the hospital. The letter is the result of a meeting of the council specially convened to consider the matter. The council expressed grave misgiving at the advertisement and stated that it has been unable to trace any effort by the hospital to secure applications of qualified persons for the appointment. The institution of a nurse-anesthetist at a hospital of the standing of Addenbrooke's appears to the council to be a retrograde step which is injurious to the public welfare. It holds that the responsibility for a patient under an anesthetic cannot be safely entrusted to any one who is not medically qualified. As far as the anesthetic is concerned, the anesthetist has to bear the full responsibility, as has been frequently proved in the coroner's court. These duties cannot properly be assigned to an unqualified person. If they were and an accident befel the patient, public resentment would be aroused against the hospital concerned. The Royal Colleges of Physicians and Surgeons have recognized the specialty of anesthetics by granting a diploma. This advance has been due to the labors of medical men who devoted themselves to the study of anesthetics. Further progress can be achieved only by the encouragement of similar efforts. The

council points out that in Canada, where the nurse-anesthetist was common, she has now been made illegal and that in the United States her existence is deplored by many of the best authorities. For England, which has in many ways been foremost in the advance of anesthetics, to take a backward step by encouraging unqualified anesthetists would be lamentable.

The staff of Addenbrooke's Hospital replied suggesting that "the grave misgiving" of the committee may be mitigated by the following facts: With the outbreak of war, five of the eight anesthetists of the hospital were mobilized, while the beds have been increased by more than 140 and another 150 are in contemplation. Some inexperienced anesthetists have had to be employed. At the present moment the training of students in administering anesthetics at the London hospitals cannot be ideal, and it is from these that resident anesthetists are drawn. The staff therefore considered the training of its own anesthetists. Some of them had considerable experience as sister-anesthetists in the United States and on the European continent, and a large hospital in England has employed them for years with entire success. To safeguard the interests of surgeon and patient it was decided that each sister-anesthetist should receive six months' training—double that required for a physician.

Butter Ration Reduced

At this season arrivals of butter from Australia and New Zealand are always at their lowest, rising from November with the advance of the summer months in the Southern Hemisphere. Normally this seasonal decline is made good by imports from Denmark and Holland, which are not now available. The minister of food has therefore decided as a precautionary measure to conserve stocks by reducing the butter ration from 4 to 2 ounces a week. But the present fat ration, which includes butter, margarine and cooking fats, will remain at 8 ounces. Thus the diminished butter ration can be compensated by increase of the other fats. As the margarine is vitaminized it is a complete substitute for butter. Another offset is that the meat ration (which is measured by expenditure) is increased from 44 to 50 cents a week. In a broadcast the minister of food has said "In this second year of the war you will have enough to eat, but I shall have to ask you to be prepared for changes for short periods."

ITALY

(From Our Regular Correspondent)

Sept. 15, 1940.

Hospitals in Albania

A project for the enlargement of hospitals functioning in Albania and for the construction of new hospitals with state funds was approved. New pavilions similar to those constructed in the Tyrana hospital will be built in the hospitals of Scutari, Koritza and Valona. In the Scutari hospital the enlargement of the hospital will begin immediately. X-ray equipment is already being established in the Scutari, Koritza and Valona hospitals. The Durazzo hospital will be enlarged to three times its capacity. Other plans for constructing a new hospital in Argirocastro and small hospitals in Kukes and Pesh Kopija and, later on, in Perat and Elbassan are being studied.

Prevention of Measles

Professor Petragnani, general director of public health, recently presented a report on the results of administering a phenolated placental extract which is used in the prevention of measles and known in Italy by the name of "Fenepla." In the Cosenza province the preparation was administered to sixty-seven children who had never had measles but who were exposed to the disease. It developed in six cases. Of seventy-four exposed children in the Reggio Emilia province who were vaccinated with the preparation against measles it developed in none. The author found the preparation valuable in preventing measles especially in schools, colleges and resorts for children.

Congress of Dermatology and Syphilology

At the recent meeting of the thirty-second National Congress of the Società Italiana di Dermatologia e Sifilografia in Bologna Prof. Leonardo Martinotti presided. The first official topic was "Subacute Inguinal Lymphogranuloma." Professor Cerutti reviewed the literature on experimental transmission of the infection. Granular corpuscles exist in the tissues in all cases; whether they represent the true virus of the infection has not been proved. Professor De Giorgio discussed the preparation of antigens for Frei's intradermal reaction. Professor Midana discussed extraglandular forms of the infection.

The second official topic was "Cutaneous Tuberculosis." Professors Bergamasco and Cibiriani reviewed the statistics for Italy, by which they showed that the disease had diminished during the last ten years. Professor Pinetti reviewed the literature on the various forms of tuberculous ultravirus, which, according to him, is not the pathogenic factor of cutaneous tuberculosis: Professor Scolari spoke on the evolution of tuberculin allergy and the desensitizing factors. Professor Lisi discussed experimental cutaneous tuberculosis. Professor Klarer discussed the relations between allergy and immunity in the production of organic reactions of defense and the type of reactions connected with cutaneous tuberculosis. Professor Bertoncini spoke on lupus vulgaris. Professor Versari spoke on the treatment of cutaneous tuberculosis with special reference to climate, heliotherapy, proper diet, local chemical therapy, and local and plastic surgery. The election of president for the society resulted in the reelection of Prof. L. Martinotti.

Deaths

Senator Giuseppe Tusini, professor emeritus of the surgical clinic at Genoa University, is dead. He published books and articles, some of which were "Echinococcosis of the Liver," "Varieties of Endothelia," "Actinomycosis of the Foot," "Chronic Polyadenopathy in Relation to Glanders in Pathogenesis," "Lymphatic Varicocele from Filariosis" and "Cysts and in Tumors of the Pancreas." He was the originator and founder of the Castrensian University during the war of 1914-1918. It was established near the front for students of medicine and surgery who were at the front and who attended the university during rest periods in winter.

Marriages

CHARLES BRUCE KERN, Lafayette, Ind., to Mrs. J. Cooper Props of Muncie, at Harrodsburg, Ky., October 4.

JOSEPH GORDON, Ray Brook, N. Y., to Miss Beatrice Brecker of Brooklyn at Plattsburg, N. Y., October 26.

RUSSELL K. HORSMAN, Kokomo, Ind., to Miss Lotte Nevella Benedick at Manhattan, Kan., September 28.

WILBUR GEORGE DOWNS, Saranac Lake, N. Y., to Miss Helen Hartley Geer of New York, September 14.

WILLARD A. PRICE, Nappanee, Ind., to Miss Nellie R. Coppes of Denver, at Crete, Neb., in September.

LAWSON J. CLARK, Indianapolis, to Miss Mildred Harting of North Manchester, Ind., October 11.

CLARENCE C. BOSSELMANN to Miss Clementine Foster, both of Fort Wayne, Ind., October 5.

LYMAN D. EATON to Miss Alberta Marie Speicher, both of Indianapolis, October 12.

MILTON A. SPITZ, St. Louis, to Miss Lucille Lesch of Madison, Wis., October 6.

IVAN CARLYLE, Sedalia, Ind., to Mrs. May Kingery of Middlefork, October 9.

FAY F. BOYS to Miss Jean Sopko, both of East Chicago, Ind., September 28.

JOHN D. COLLINS to Miss Mary Johnston, both of Seattle, in August.

Deaths

William Lawrence Estes ✠ Bethlehem, Pa.; University of Virginia Department of Medicine, Charlottesville, 1877; University of the City of New York Medical Department, 1878; member of the House of Delegates of the American Medical Association in 1909; member of the American Surgical Association; lectured on physiology and hygiene at Lehigh University from 1883 to 1923; fellow of the American College of Surgeons; served in various capacities on the staff of St. Luke's Hospital; in 1934 received the honorary degree of doctor of science from Lehigh University; aged 84; died, October 20, of coronary sclerosis with occlusion.

Nathaniel Hawley Brush ✠ Santa Barbara, Calif.; Johns Hopkins University School of Medicine, Baltimore, 1914; member of the American Psychiatric Association and the Association for Research in Nervous and Mental Disease; past president of the Santa Barbara County Medical Society; served during the World War; instructor of psychiatry at his alma mater from 1916 to 1918; on the staff of the Santa Barbara Cottage Hospital and the Santa Barbara General Hospital; aged 53; died, October 21, of carcinoma of the pancreas and biliary obstruction.

Henry Wellington Yates ✠ Detroit; Detroit College of Medicine, 1894; emeritus professor of gynecology and obstetrics at his alma mater, now known as the Wayne University College of Medicine; fellow of the American College of Surgeons; past president of the Wayne County Medical Society and for many years chairman of the cancer committee; gynecologist, Providence and William Booth Memorial hospitals; consultant in gynecology, Woman's Hospital; formerly member of the city plan commission; aged 73; died, October 13, in the Harper Hospital of bronchiectasis and arteriosclerosis.

Joseph A. Estopinal, New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1899; member of the Louisiana State Medical Society; at one time secretary of the state board of health; served during the World War; formerly medical inspector of public schools in St. Bernard Parish; at one time professor of laryngology and rhinology, New Orleans Post-Graduate School of Medicine; on the staff of the Illinois Central Hospital; formerly on the staff of the Eye, Ear, Nose and Throat Hospital and the Charity Hospital; aged 64; died, October 9.

Henry Carlton Courten ✠ Richmond Hill, N. Y.; University and Bellevue Hospital Medical College, New York, 1909; fellow of the American College of Surgeons; attending orthopedist to the Jamaica, Queensboro, Lutheran and Mary Immaculate hospitals, Jamaica; visiting orthopedist to the Queen's General Hospital, Jamaica; consulting orthopedic surgeon, Rockaway Beach (N. Y.) Hospital, Evangelical Deaconess Hospital, Brooklyn, and the Flushing (N. Y.) Hospital; past president of the Medical Society of the County of Queens; aged 61; died, October 15.

John P. Munroe, Charlotte, N. C.; University of Virginia Department of Medicine, Charlottesville, 1885; member of the Medical Society of the State of North Carolina; member of the House of Delegates of the American Medical Association in 1915; fellow of the American College of Physicians; past president of the Mecklenburg County Medical Society; formerly professor of neurology and practice of medicine, North Carolina Medical College; president and member of the staff of the New Charlotte Sanatorium; aged 83; died, October 14, of pneumonia.

Torr Wagner Harmer ✠ Boston; Harvard Medical School, Boston, 1907; member of the American Association for the Surgery of Trauma and the New England Surgical Society; fellow of the American College of Surgeons; instructor in anatomy and assistant in surgery at his alma mater; consulting surgeon at the Massachusetts Eye and Ear Infirmary and at the Somerville, Winchester, Symmes Arlington and Waltham hospitals; aged 59; died, October 2, of carcinoma.

Roy Jones Holmes ✠ Miami, Fla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1917; past president of the Dade County Medical Society; member of the American Urological Association; fellow of the American College of Surgeons; chief surgeon, urologic division, James M. Jackson Memorial Hospital; visiting urologist, Victoria and Dade County hospitals; aged 46; died, October 9, of acute coronary thrombosis.

Francisco Jose Hernandez ✠ San Juan, P. R.; University of Pennsylvania Department of Medicine, Philadelphia, 1904; professor of clinical pathology at the School of Tropical Medicine of the University of Puerto Rico, under the auspices of Columbia University; on the staff of the Sanatorio de la Sociedad Española de Auxilio Mutuo y Beneficencia, Rio Piedras; aged 58; died, October 4, of heart disease.

Ovid Clemmons Foote ✠ Surgeon Lieutenant Commander, United States Navy, retired, Washington, D. C.; Johns Hopkins University School of Medicine, Baltimore, 1912; member of the American Urological Association; entered the navy in 1914; served during the World War; retired in 1924 for incapacity resulting from an incident of service; aged 53; died in October of injuries received in an automobile accident.

Guy Hunt Cochran ✠ Los Angeles; Columbia University College of Physicians and Surgeons, New York, 1900; member of the Pacific Coast Surgical Association; fellow of the American College of Surgeons; aged 67; chief of staff of Children's Hospital from 1915 to 1937; for many years on the attending staff of the Hospital of the Good Samaritan, where he died, October 7, of carcinoma of the bronchus.

Walter William Propst ✠ Scranton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1916; past president of the Lackawanna County Medical Society; served during the World War; at various times on the staff of the West Side, Scranton State and Mercy hospitals, Scranton, and the Mid-Valley Hospital, Peckville; aged 55; died, October 11, of pneumonia.

Nicholas Francis Brecker, Philadelphia; Medico-Chirurgical College of Philadelphia, 1907; member of the Medical Society of the State of Pennsylvania; on the staffs of the Presbyterian and the Philadelphia General Hospital; aged 58; died, October 11, of acute coronary occlusion.

Lewis Gordon Allbritton, Birmingham, Ala.; Indiana University School of Medicine, Indianapolis, 1928; member of the Medical Association of the State of Alabama; aged 40; died, October 4, in the Johns Hopkins Hospital, Baltimore, of glioma and spongioblastoma multiforme.

Alexander Donald Ferguson, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912; served during the World War; aged 54; died, October 14, of injuries received when he was struck by an automobile.

Jesse Ira Whittenberg, Louisville, Ky.; Kentucky School of Medicine, Louisville, 1894; formerly county coroner and health officer; served with the United States Public Health Service during the World War; aged 68; died, September 24, of carcinoma of the throat.

Adelbert Boyd Miller ✠ Erie, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1905; past president of the Erie County Medical Society; served during the World War; aged 59; president of the staff of the Hamot Hospital, where he died, September 11.

Rudolph Clarence Pfeil ✠ Milwaukee; Milwaukee Medical College, 1908; served during the World War; on the staffs of the Johnston Emergency Hospital and St. Luke's Hospital; aged 57; died, October 3, of carcinoma of the pancreas.

George Washington Anglin, Warsaw, Ind.; Northwestern University Medical School, Chicago, 1905; member of the Indiana State Medical Association; served during the World War; aged 66; was drowned, September 15.

Morris Bander, New York; University and Bellevue Hospital Medical College, New York, 1925; physician in the men's hygiene department, Brooklyn College; aged 39; died, October 22, of coronary thrombosis.

Frederick Da Costa Austin, Charlotte, N. C.; North Carolina Medical College, Charlotte, 1907; county coroner; aged 54; died, October 14, in the Mercy Hospital of cerebral hemorrhage and chronic nephritis.

Walter R. Coryell, St. Louis; American Medical College, St. Louis, 1878; aged 86; died, October 10, in the Alexian Brothers Hospital of injuries received in a fall.

Rene Plamondon, Quebec, Que., Canada; Laval University Faculty of Medicine, Quebec, 1906; aged 56; died, August 21.

Correction.—Since publication of a statement concerning the relationship of Dr. John T. Hodgen, former President of the American Medical Association, and the late Dr. William Allen Pusey, in THE JOURNAL, October 12, further correspondence from relatives and friends shows that Dr. Hodgen was a second cousin to Dr. Pusey.

Correspondence

MEDICAL CONTROL OF MOBILIZATION

To the Editor:—In an editorial entitled "The Medical Control of Mobilization" in THE JOURNAL, October 12, it is stated that "Much control over the epidemic intestinal diseases such as typhoid and dysentery can be exerted by suitable preventive measures, but the situation with regard to respiratory diseases is more difficult. In such conditions as measles and mumps neither prevention nor treatment can be much better controlled than formerly."

I am under the impression that the use of immune globulin and convalescent serum in measles and of convalescent serum in mumps has become firmly established as of great value in the prophylaxis of these diseases. Certainly in hospital practice we no longer have the terror of measles running through our wards at will as it used to do, and it would seem to me that by establishing depots of suitable convalescent serum the same situation would hold in army camps.

By inoculating all the susceptible in the same building one surely should cut down the spread of these diseases to a minimum.

Of course large amounts of convalescent or immune serum would be necessary, but we all know of centers in New York and elsewhere where such is already the case. It would seem that establishing such facilities should be one of the important adjuncts of mobilization.

CHARLES F. WALCOTT, M.D., Cambridge, Mass.

CLOSED METHOD OF TREATING COMPOUND FRACTURES

To the Editor:—The editorial (THE JOURNAL, September 21) devoted to the "Closed Method of Treating Compound Fractures and Infected Wounds" stirs me to add a few words to the discussion. These words have been repeated many times during the past fifteen years, becoming somewhat of a habit, harmless but perhaps boresome. They run as follows:

The elements of this method were erected into a doctrine sometime before 1885 by Leopold Ollier of Lyons. He called it simply "delayed dressings" and then elaborated on the technic in much the same terms that are employed today, plaster, odor and all. Some of the credit for his ideas he assigned to Langenbeck and to Poncet. Since then his doctrine has been quite faithfully followed by the Lyonese, in theory and in practice. Mention in the literature is rare because the ideas involved are taken for granted by the heritors of the Ollier tradition. Besides, the aloof, dour old town, birthplace of Emperor Claude, a "free city" for ages, home of Rabelais and Dolet, haven of Calvin and Servetus, disdains advertising anyhow. But a special application of the method to the treatment of compound fractures with delayed union was advanced by Louis Tixier in 1917, both in the literature and before groups of American surgeons, and it was also discussed by Jean Haour in a thesis about 1925.

As a consequence of the foregoing, I once again urge that the method be associated with the name of Ollier. Any one familiar with the monumental "Traité des resections" or with the surgical practices of the Lyons school will agree that in this way the memory of the "distinguished surgeon of Lyons" (Senn) will be justly honored. Moreover, the method will receive a convenient appellation. Ollier's own term is inadequate and the one used by THE JOURNAL is cumbersome. Therefore let it be "Ollier's Method."

ALBERT DE GROAT, M.D., Detroit.

CHRONIC NEPHRITIS AND LEAD POISONING

To the Editor:—I have read with interest your leading article in THE JOURNAL of May 4 on my book on "Chronic Nephritis and Lead Poisoning." This book was published seven years ago, and since that date the Queensland government has brought in stringent legislation against the use of lead paint in places accessible to children. This action was taken after my observations had been fully investigated. Much more confirmatory work has been carried out by Dr. Gilbert Murray and his co-workers of the Commonwealth Health Department and by Dr. E. H. Derrick of the Queensland Health Department.

Owing to the new legislation these cases will soon become a rarity, and it is tragic that such splendid research material is being entirely neglected because, owing to war activities here, no one is able to devote time to the further investigation of this very important question, which will almost certainly throw new light on the etiology of many cases of arteriosclerosis.

If an American research organization could send out a skilled researcher I feel sure that in two years he would be able to collect sufficient evidence to write a new chapter on vascular sclerosis. Those of us who have studied this question in Queensland can state dogmatically that in this climate chronic lead poisoning in childhood, when sufficiently severe to cause paralysis, is almost invariably followed by arteriosclerosis and chronic nephritis in early adult life. Most of Queensland is situated within the tropics, and it is my belief that the heat factor plays some part in this morbid process.

You can be assured that herein is a remarkable opportunity for research for which very little funds would be needed.

As the cases are fast disappearing I feel that it would be most unfortunate if this exceptional opportunity were neglected. Can you help?

L. J. JARVIS NYE, M.B., CH.M., F.R.C.P.,
Queensland, Australia.

"ELECTRICAL CONVULSION TREATMENT OF MENTAL DISORDERS"

To the Editor:—In the editorial in THE JOURNAL, August 10, on "Electrical Convulsion Treatment of Mental Disorders,' credit was accorded to Cerletti for first utilizing the electric current in 1937 to induce epileptic seizures in animals. I should like to call attention to a paper by Clark and Wall (Unconsciousness Produced by Electric Currents, *Quart. J. Exper. Physiol.* **24**:85 [Feb.] 1934) which states that in 1900 Leduc, by applying certain types of current to an animal's head, produced a fit with loss of consciousness varying in degree from a condition resembling sleep to one of deep coma and loss of reflexes but without causing any permanent damage to the animal.

Robinovitch (Sommeil électrique, Nantes, 1906) also described a condition in animals which she called "epilepsie électrique" and in which loss of consciousness was associated with many features characteristic of the epileptic fit. Weiss (*Bull. Soc. Internat. des Elect, Paris* **1**:417:1911) and Hess (*Compt. rend. Soc. de biol.* **107**:1333 [Aug. 5] 1931) confirmed these results.

Clark and Wall showed that (1) animals displayed no fear of repeated shocks and seemed quieter and more docile for a considerable time after treatment; (2) an initial fall in blood pressure occurred which was abolished by section of the vagi; (3) by direct observation through a window in the skull the cerebral vessels were constricted, followed by dilatation after the current was switched off, and (4) direct cerebral stimulation and not vasoconstriction of the cerebral vessels was responsible for the convulsions, since stimulation of the proximal

end of the cervical sympathetics, while producing vasoconstriction, did not elicit an epileptiform seizure.

I trust that these references will add to the experimental background of the electroconvulsive therapy.

WILLIAM FURST, M.D., Philadelphia.
Philadelphia General Hospital.

USE AND ABUSE OF ADVERTISING BROCHURES

To the Editor:—Your editorial in THE JOURNAL, October 5, entitled "Use and Abuse of Advertising Brochures" calls attention to a condition which results in serious economic waste, waste of the recipient's time in inspecting and disposing of unwanted brochures, waste in material and postage on the part of the sender, and waste in the way of an unnecessary tax on the postal facilities of the government.

Besides the example noted in your editorial of the doctor who had received over 300 pounds of such matter in about a year's time, I recall an example in which during an absence of two months there came to a doctor's office 16⅔ pounds, or 222 pieces, of such material, of which not more than 5 per cent was of any possible interest to him.

This wasteful condition will be remedied if recipients will (1) Write "Refused" or "Not accepted" above address, (2) draw a line through but leave legible the name and address and (3) remail.

The brochure will then be returned to the sender, who will pay the return postage and will or should revise his mailing list.

W. E. CARSON, M.D., Pittsburgh.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

NEPHROSIS OR NEPHRITIS

***To the Editor:*—What diet and medication can be suggested for an 18 year old youth with considerable swelling of the face, rales throughout the lung fields, swelling of the ankles and possibly slight fluid accumulation in the abdomen? The heart sounds are of normal quality, rate and rhythm; there is normal temperature; the blood pressure is 160 systolic, 110 diastolic; the specific gravity of the urine is 1.010 and the urine is almost solid with albumin. There are no casts, blood or pus. The urea nitrogen is 20.2 mg., urea clearance 63 per cent, hemoglobin 52 per cent, red cells number 2,980,000, white cells 6,800. There is a normal differential count. The tonsils were removed years ago and there appears to be no other source of infection. Is this more of a nephrosis than nephritis? Would it be advisable to give salyrgan?** M.D., New Jersey.

ANSWER.—Whether or not a condition of pure nephrosis or a nephrotic syndrome of Bright's disease or both exists is at present the subject of much discussion. Nevertheless the nephrotic picture in its purer forms is definitely an entity, and its diagnosis and treatment differ from that of nephritis. In addition to the features mentioned in the query there are constantly present in nephrosis elevation of blood cholesterol to levels frequently above 300 mg. (this being the only increase in blood chemistry) and a definite lowering of plasma protein, the albumin fraction to a greater degree than globulin, resulting in a reversal of the albumin: globulin ratio. Blood pressure is usually within normal limits and elevation of the degree noted indicates vasoconstriction, which may result in renal ischemia with ultimate insufficiency and a clinical picture more of the uremic type.

However, the process rarely reaches this stage, since recovery takes place or death occurs from intercurrent infection. A great point of difference between nephritis and so-called pure nephrosis is that patients with the latter succumb to a pneumococcic infection, commonly pneumococcic peritonitis; in fact, some writers state that they have observed only this cause of death in such cases. Among the commonest causes of onset or recurrence is chilling. The diagnosis in this case would probably be nephrosis. When tubular damage exists, the use of mercurial diuretics such as salyrgan is not advised. The xanthine derivatives, especially theophylline and theobromine and their derivatives may be used (Marvin, H. M.: Therapy of Dropsy, THE JOURNAL, March 2, 1940, p. 757). More important is the fact that the edema is due to decrease of osmotic pressure of the blood resulting from loss of plasma protein. A common fault in treatment is inadequate protein in the diet. This may be administered in any form, but meat should furnish a large portion of the protein. Quantitatively, three needs must be fulfilled: (1) the daily requirement which by liberal calculation may be 1 Gm. per kilogram of dry weight, (2) renal loss, often from 20 to 30 Gm. daily, and (3) reserve for building up the depleted plasma proteins. This amount is arbitrary and may be increased until the total approximates the patient's tolerance. It should be borne in mind that a gram of meat, for example, does not represent a gram of protein.

Absolute restriction of sodium is necessary in nephrosis. This means no salt, sodium bicarbonate or alkaline preparations. The dietary management is most difficult since a daily diet containing 3 Gm. or less of salt is almost a problem for quantitative diet experts. Butter must be unsalted, no milk is permitted and bread must be specially prepared without salt, in addition to avoiding all salting of other food and avoiding salt-containing food, potato chips and the like. Potassium chloride 3 Gm. given daily to be used as salt on food or in 0.5 Gm. coated tablets may be used. There is no need for undue fluid restriction, as edema is influenced by factors other than water intake. Other than this, rest, warmth and other general measures may be indicated.

ONE HOUR-TWO DOSE DEXTROSE TOLERANCE TEST

***To the Editor:*—What is the significance of the sugar tolerance test which is completed in one hour by the following method: 1. Collect specimens of urine and blood and administer 50 Gm. of dextrose. 2. In one half hour repeat. 3. In another half hour collect a third specimen of blood and urine. How can this test prove or disprove a diabetic blood sugar curve, when the essential diagnostic point is the return of the blood sugar to normal in two to three hours in the nondiabetic and the lack of return in the diabetic? Kindly discuss, especially in its application to the diagnosis of renal glycosuria.** M.D., Ohio.

ANSWER.—The test described is the one hour-two dose procedure devised by Exton and Rose. It is based on the well known Hamman-Hirschman (Staub-Traugott) effect: the administration of dextrose to a normal individual sets in motion certain processes (probably in the liver and pancreas) which make it easier for the body to utilize a second amount of dextrose given a short time later so that the peak of a second blood sugar curve is lower than that of the first; in a diabetic individual, however, the second dose gives rise to still more pronounced hyperglycemia.

Exton and Rose outlined criteria of diagnosis which depend chiefly on the height and extent of the blood sugar curve during the second half hour as opposed to that during the first. These criteria have been analyzed by Matthews, Magath and Berkson, who reported recently on results with the Exton-Rose test in a series of 117 normal persons and 304 individuals diagnosed clinically as diabetic. They conclude that the most reliable figure obtained is the hour value for the blood sugar and suggest that the half-hour value be dispensed with. They regard 158 mg. per hundred cubic centimeters for the hour value as a critical level; individuals with a reading below this point are regarded as nondiabetic and those with values at or above this value are designated as presumptively diabetic. The diagnosis of diabetes is thought definite if the hour value is 180 mg. or above.

These conclusions make one wonder whether it is profitable to divide the 100 Gm. of dextrose into two doses as advised by Exton and Rose, since the revised procedure suggested by Matthews and his co-workers returns closely to that of the standard dextrose tolerance test. These workers suggest two possible advantages of the divided dose even though only the fasting and the hour values are obtained: dividing the dose avoids the necessity of taking an unpleasantly large amount of sugar at one time and possibly brings out more clearly the divergence of the diabetic from the normal response.

The only significant difference between the response of the individual with renal glycosuria and that of the normal person is that the former will exhibit glycosuria throughout the test or at least after the administration of dextrose.

It must be borne in mind that, in the Exton-Rose test as well as in the standard sugar tolerance test, interpretation of the results will vary depending on whether venous or capillary blood samples are taken; capillary values will, in the normal person, be from 10 to 50 mg. higher after dextrose than the corresponding venous figures. Furthermore any of the conditions, such as previous restriction of carbohydrate, previous administration of insulin or infections, will influence the Exton-Rose just as they will the standard sugar tolerance test.

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EXTRAGENITAL SERONEGATIVE PRIMARY SYPHILIS

To the Editor:—A chancre of the finger, diagnosed by finding spirochetes seventeen days after the lesion first appeared, healed rapidly after treatment started. Blood tests were negative. 1. If the patient remains seronegative and without further symptoms or signs and continues treatment, what is the likelihood of transmitting the disease and by what manner and for how long a period after the initial lesion has healed? 2. What would you consider adequate treatment? 3. What do surgeons usually do about continuing work?

M.D., Republic of Panama.

ANSWER.—1. If this patient with extragenital seronegative primary syphilis remains seronegative as to blood spinal fluid during one year of continuous antisyphilitic treatment, the risk of transmitting the infection to others from any ordinary daily contact is practically nil. For the complete protection of others, sexual intercourse should be completely avoided for the first six months of treatment; during the second six months it may be resumed with condom protection during the arsenical phases of therapy only; during the ensuing year of probation, it may be permitted with condom protection. Unrestricted sexual intercourse should not be permitted until completion of one year of post-treatment probation. Moist kissing should also be avoided for the year of treatment and the year of probation.

2. Adequate treatment consists of courses of an arsphenamine alternating with courses of a bismuth compound by the continuous system, no rest period being permitted, carried out during a full year of seronegativity of the blood. The system, drugs and dosage should be those suggested by the Cooperative Clinical Group.

3. There is no objection to a surgeon continuing work, though of course he should always wear rubber gloves during any surgical procedure, no matter how minor.

MORPHINE AND PROSTIGMINE IN PERITONITIS

To the Editor:—Would you explain the effects of prostigmine and morphine in peritonitis.

M.D., New Jersey.

ANSWER.—Morphine and prostigmine are of value in ileus in that they both increase the intestinal tone. In peritonitis, prostigmine preferably should not be used, because it not only increases the intestinal tone but also increases peristalsis, which is undesirable in peritonitis in that the protective adhesions are likely to be broken down. Whereas prostigmine is of value in adynamic ileus not associated with peritonitis, it should not be used in adynamic ileus associated with peritonitis because of the reasons given. On the other hand, morphine is the ideal drug for use in peritonitis. It increases the intestinal tone without increasing peristalsis. In this way it overcomes the deleterious effect of intestinal dilatation incident to the adynamic ileus associated with peritonitis and at the same time does not favor the spread of peritonitis by breaking down the protective adhesions. Opium and its derivatives have been used for decades in the treatment of peritonitis. Standard treatment of typhlitis has long consisted of massive opianization. It has been previously thought that opium splinted the bowel and relaxed it, whereas in reality opium and its derivatives actually increase the tone of the bowel, and it is because of this action that morphine is beneficial in peritonitis. The dose of morphine depends on the age of the patient. For an adult from 0.016 to 0.02 Gm. (one-fourth to one-third grain) may be given every three to four hours. The patient should be kept narcotized with the drug. Because of its depressing effect on the respiratory center, it is desirable to give oxygen. Oxygen also has a definite decompressive effect on the intestine in that the inhalation of high concentration of oxygen favors the absorption of nitrogen from the intestine.

FRACTURE OF TUBEROSITY OF TIBIA AND ARTHRITIS

To the Editor:—A woman aged 54 suffered a twisting injury of her right knee. X-ray examination shows a compression fracture of the lateral tuberosity of the tibia. Treatment as advised by a specialist consists of an open operation elevating the compressed cartilaginous surface of the tuberosity and supporting it in its elevated position by means of bone blocks taken from the ilium or lower down in the tibia. The patient has had a preexisting degenerative arthritis involving among other joints the injured knee. I would appreciate a discussion of the possibility of the arthritis predisposing to the fracture and references in regard to the prognosis following surgery and as to the prognosis as regards the disability if surgery is refused.

M.D., Washington.

ANSWER.—There is little evidence to be found in medical literature which would suggest that chronic arthritis is a predisposing factor in the production of fractures. Occasionally osteoporosis associated with arthritis may be a predisposing factor in the production of joint surface infractions. This has occurred in osteomalacia or hyperparathyroidism in a number of reported cases. The recommendation to elevate the depressed cartilaginous surface of the tuberosity of the tibia is definitely in accord with the best surgical practice.

If the underlying bone is badly crushed or atrophic, introduction of a bone block would be indicated. Not uncommonly it is also advisable to remove the semilunar cartilage which may be torn or displaced as an additional complication in injuries of the type described.

As is well known, trauma to a joint with or without fracture is likely to produce some permanent loss of function. Because of the history of a preexisting degenerative arthritis the prognosis in this case, regardless of treatment, should be reserved.

SUGAR IN MEDICINES USED BY DIABETIC PATIENTS

To the Editor:—A problem that is arising with increasing frequency is the question of sugar content in various products used by patients with diabetes mellitus. For instance, the covering of one well known brand of ferrous sulfate is quoted by the manufacturers themselves as containing 6½ grains of sugar. Patients frequently ask about the sugar content of tooth powders and pastes, the powder used in causing adherence of dental plates and the like. Is it advisable to be particularly strict in the use of such preparations and is there a likelihood of disturbed control?

M.D., Illinois.

ANSWER.—The quantity of sugar or other forms of carbohydrate on or in pills and medical powders is so insignificant as compared with the total carbohydrate in the diet as to be negligible. This does not hold for various liquid medicines in which sugar is sometimes present in large amounts.

If one of the pills mentioned does contain 6½ grains (0.4 Gm.) of sugar, two would contain even less than a gram, and six a day 3 Gm., which would be only one fiftieth of the usual amount of carbohydrate in the diabetic diet.

DANGERS FROM ENAMELWARE

To the Editor:—In Queries and Minor Notes in the August 31, issue of The Journal a question was asked on ill effects reported from chipped particles of enamel. Although the question seems to indicate an interest in possible physical damage, the answer includes possible chemical injury. The answer does not include a discussion of the possibility of antimony poisoning. It is rather common knowledge that antimony is used by many kitchenware manufacturers, sometimes in rather high concentrations in the production of kitchenware. The antimony gives a more opaque enamel and permits thinner application over the metal, which makes it desirable from the enameler's standpoint. In cheap enamelware, however, acid foods extract this antimony and there is a definite danger of poisoning to any one eating such food. There are recorded outbreaks of this kind. Under these circumstances enamelware cannot be given an unqualified "clean bill of health."

**G. I. Wallace, Ph.D.,
Department of Bacteriology, University of Illinois, Urbana, Ill.**

AGGLUTINATION WITH DYSENTERY BACILLUS

To the Editor:—In The Journal for October 19, there appears an inquiry concerning "Agglutination with Dysentery Bacillus." In the answer it is stated that the patient who has an agglutination which was typical for 1:160 with dysentery bacilli of the Flexner type has had a previous bacillary dysentery infection. Although this interpretation of the dysentery agglutination test holds true in many cases, it should be emphasized that a positive Flexner agglutination may be obtained in patients who present neither history nor evidence of Flexner dysentery. Certain individuals may have a relatively high titer of normal agglutinins for Flexner dysentery bacilli. Also the particular technic employed in setting up the test (time and temperature of incubation, and so on) may materially influence the result. Furthermore, because of antigenic relationship of the Flexner group of dysentery bacilli to other micro-organisms, for instance B. alkalescens, patients infected with the latter organism may have agglutinins in their serum giving a positive agglutination with Flexner dysentery bacilli.

Erwin Neter, M.D., Buffalo.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, November 16, page 1744.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 17-19. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, Dec. 11. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: * Denver, Jan. 7-10. Applications must be on file not later than Dec. 23. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: * *Endorsement.* Hartford, Nov. 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

GEORGIA: Atlanta, June. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Jan. 8-11. Sec., Dr. James A. Morgan, 48 Young Building, Honolulu.

IDAHO: Boise, April 1. Dir., Bureau of Occupational License, Mr. H. B. Whittlesey, 335 State Capitol Bldg., Boise.

ILLINOIS: *Written.* Chicago, Jan. 21-22. *Reciprocity.* Chicago, Jan. 23. Supt. of Registration, Dept. of Registration and Education, Mr. Lucien A. File, Springfield.

INDIANA: Indianapolis, June 17-19. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, Citizens Trust Bldg., Fort Wayne.

IOWA: Des Moines, Dec. 9-11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 10-11. Sec., Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Dec. 3-5. Sec., State Board of Health, Dr. A. T. McCormack, 620 Third St., Louisville.

MARYLAND: *Regular.* Baltimore, Dec. 10-13. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 10-11. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: * Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Jan. 21-23. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity.* Helena, March 31. *Written.* Helena, April 1. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEVADA: *Reciprocity with oral examination,* Feb. 3. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 13-14. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 17-18. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 14-15. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 27-30. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, State Education Department, 315 Education Bldg., Albany.

NORTH CAROLINA: *Reciprocity.* Durham, Dec. 10. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 7-10. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, Dec. 9-12. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, Dec. 11. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: * Portland, Jan. 14-16. Exec. Sec., Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia, January. Acting Sec., Bureau of Professional Licensing, Miss Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * Providence, Jan. 2-3. Sec., Division of Examiners, Dr. Robert M. Lord, 366 State Office Bldg., Providence.

SOUTH DAKOTA: * Pierre, Jan. 21-22. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TEXAS: Austin, Nov. 25-27. Sec., Dr. T. J. Crowe, 918-920 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 11. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 4-6. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: * Seattle, Jan. 13-15. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WISCONSIN: * Madison, Jan. 14-17. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Feb. 3-4. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Dec. 17. Sec., Dr. Robert L. Nugent, University of Arizona, Science Hall, Tucson.

CONNECTICUT: Feb. 8. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, April 21-22. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

IOWA: Des Moines, Jan. 14. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor, Detroit and East Lansing, Feb. 14-15. Sec., Miss Flora E. Dube, East Lansing.

MINNESOTA: Minneapolis, Jan. 7-8. Sec., Dr. J. Charnley McKinley, University of Minnesota, 126 Millard Hall, Minneapolis.

NEBRASKA: Omaha, Jan. 14-15. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Feb. 15. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

SOUTH DAKOTA: *Examination.* Yankton, Dec. 6-7. *Endorsement,* Dec. 21. Sec., Dr. Gregg M. Evans, Yankton.

WASHINGTON: Seattle, Jan. 9-10. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WISCONSIN: Milwaukee, Dec. 7. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Maryland June Report

Dr. John T. O'Mara, secretary, Board of Medical Examiners of the State of Maryland, reports the written examination for medical licensure held at Baltimore, June 18-21, 1940. The examination covered nine subjects and included ninety questions. An average of 75 per cent was required to pass. One hundred and forty-eight candidates were examined, 137 of whom passed and eleven failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1940)	82.1
George Washington University School of Medicine (1940) 78		(1939)	84, 90.1,
Georgetown University School of Medicine		(1933) 77, (1939)	86
Howard University College of Medicine		(1938)	81
Rush Medical College		(1936)	82.1
Johns Hopkins University School of Medicine (1940) 79.2, 80.1, 81.1, 81.2, 81.4, 83, 83, 83, 83, 83, 83, 83.3, 83.3, 84, 84.3, 85, 85, 85, 85, 85.2, 86, 86.1, 86.2, 86.2, 87, 87, 88, 88, 88, 88.2, 89.4, 89.4, 90, 90, 90.2, 92.1, 92.5		(1939)	85,
University of Maryland School of Medicine and College of Physicians and Surgeons 80, 81, 81.4, 82, 82, 82, 82, 82, 82, 82.2, 83, 83, 83, 83, 83, 83, 83.1, 83.1, 83.2, 83.2, 83.4, 84, 84, 84, 84, 84.2, 84.3, 85, 85, 85, 85, 85, 85, 85, 85.1, 85.3, 86, 86, 86, 86, 86, 86.4, 86.4, 86.4, 87, 87, 87, 87.1, 87.3, 87.5, 88, 88, 88.1, 88.3, 88.4, 89.1, 89.2, 89.4, 89.4, 89.4, 90, 90, 90, 90.1, 90.3, 91, 91, 91.3, 91.4, 92, 92.1, 93		(1940)	79.5,
Harvard Medical School		(1939)	86
Tufts College Medical School		(1938)	81.4
University of Minnesota Medical School		(1940)	89
Columbia University College of Physicians and Surgeons		(1940)	91
Cornell University Medical College		(1930)	87.5
Hahnemann Med. College and Hospital of Philadelphia		(1938)	86
University of Pennsylvania School of Medicine 83.2, (1940) 90.5		(1938)	80.3,
University of Alberta Faculty of Medicine		(1940)	79.2
Medizinische Fakultät der Universität Wien		(1930)	85
Hamburgische Universität Medizinische Fakultät		(1924)	77.2
Karl-Franzens-Universität Medizinische Fakultät, Graz		(1938)	83
Universität Rostock Medizinische Fakultät		(1920)	79.3
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs		(1926)	85.3
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest		(1930)	76.5
Universität Zürich Medizinische Fakultät		(1937)	81.4

School	FAILED	Year Grad.	Number Failed
Hahnemann Medical College of Philadelphia		(1939)	1
Karl-Franzens-Universität Medizinische Fakultät, Graz		(1922)	1
Masarykova Universita Fakulta Lékařská, Brno		(1929)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1926)	1
Ludwig-Maximilians-Universität Medizinische Fakultät, München		(1906)	1
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau		(1926)	1
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs		(1935)	1
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest		(1930)	1
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1923), (1934)	2
Universität Basel Medizinische Fakultät		(1936)	1

Twenty physicians were licensed to practice medicine by reciprocity and twelve physicians so licensed by endorsement from January 10 through July 31. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Georgetown University School of Medicine (1938) New Jersey		(1932)	New York,
Emory University School of Medicine		(1938)	Georgia
Johns Hopkins University School of Medicine		(1936)	Illinois
Creighton University School of Medicine		(1927)	Nebraska
University of Nebraska College of Medicine		(1937)	Nebraska
Columbia Univ. College of Physicians and Surgeons		(1931)	New York
Cornell University Medical College		(1938)	New York
New York Homeopathic Medical College and Flower Hospital		(1935, 2)	New York
Ohio State University College of Medicine		(1927)	Ohio
University of Oklahoma School of Medicine		(1935)	Oklahoma
Temple University School of Medicine		(1938)	Ohio
Woman's Medical College of Pennsylvania		(1937)	New York
Meharry Medical College		(1939)	Tennessee
University of Tennessee College of Medicine		(1935)	Louisiana

University of Tennessee Medical Department.....(1890) Alabama
Baylor University College of Medicine.....(1939) Texas
Medical College of Virginia .....(1938) N. Carolina, Virginia

LICENSED BY ENDORSEMENT

School	Year Grad.	Endorsement of
College of Medical Evangelists	(1936), (1937, 2), (1938)	N. B. M. Ex.
Yale University School of Medicine	(1935)	N. B. M. Ex.
Johns Hopkins Univ. School of Medicine	(1934), (1937, 2)	N. B. M. Ex.
Cornell University Medical College	(1936)	N. B. M. Ex.
University of Buffalo School of Medicine	(1929)	N. B. M. Ex.
Duke University School of Medicine	(1937), (1938)	N. B. M. Ex.

Book Notices

Handbook of Public Health Bacteriology and Chemistry: General Information Regarding Epidemiology, Collection and Shipment of Specimens, and Bacteriologic, Serologic and Chemical Procedures. Edited by M. S. Marshall, Department of Public Health, City and County of San Francisco, California. J. C. Geiger, Director. Second edition. Paper. Price, $1.50. Pp. 150. San Francisco: J. W. Stacey, Inc., 1939.

The second edition of this useful manual retains the policy of brevity, conservatism and a careful selection of laboratory procedures. The consideration of epidemiology as a section has been omitted from this edition and epidemiologic points are considered in connection with each disease. The section on bacteriology of specific communicable diseases has been revised and discussions on chancroid, venereal lymphogranuloma and lobar pneumonia have been added. In the section on the bacteriology of shellfish the procedure of Dr. C. A. Perry of Baltimore is summarized. In the section on chemical procedures the phosphatase test for pasteurization is added. Notes on serology appear for the first time in the appendix. Other revisions and additions have been made without undue expansion of the manual. Every one engaged in public health work will find this condensed manual an invaluable and accessible source of practical information.

The Fundamentals of Nutrition. By Estelle E. E. Hawley, Ph.D., and Esther E. Maurer-Mast, M.D., University of Rochester School of Medicine and Dentistry, Rochester, New York. Including Table of 100-Calorie Portions. By Estelle E. Hawley, Esther E. Maurer and Herbert F. Van Epps, The Department of Vital Economics, University of Rochester, and Discussions of the Dietary Management in Specific Conditions. By Collaborators Associated or Formerly Associated with The University of Rochester School of Medicine and Dentistry. With a foreword by John R. Murlin, Ph.D., Sc.D., Professor of Physiology and Director of the Department of Vital Economics, University of Rochester. Cloth. Price, $5. Pp. 477, with illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1940.

This book presents the subject of nutrition from a fresh point of view. Its contents are divided into five sections. The first section gives a brief but adequate discussion on energy metabolism and includes useful data and charts. The second section deals with the fundamentals of nutrition and includes three chapters, on classification of foods, calculation of energy requirement, the normal diet and low cost meals. Each chapter is concise, practical and down to date. Tables are used frequently to epitomize facts. The third section is devoted to diet therapy and includes discussions of the dietary management in specific disease by various physicians. The collaborators of this section are for the most part those associated with the University of Rochester School of Medicine and Dentistry and others who were formerly associated with the institution. These contributions are conservative in presentation and no attempt has been made to overemphasize the role of diet in the specific disease discussed. The discussions are short and to the point. The concluding chapter of this section is devoted to a discussion of vitamin and vitamin deficiencies. Each vitamin and the corresponding deficiency state resulting from its absence in adequate amounts are discussed in a clear and authoritative manner. The discussions are succinct and are presented in as practical a manner as possible. The fourth section is devoted to diet planning and includes a large amount of valuable and useful data. The authors have selected the 100 calory portion in preference to the 100 Gm. "share" or standard serving. They contend that the 100 calory portion establishes one common basis for comparison and in addition is easily visualized, since it is so frequently the average serving or simple multiple. These tables are useful and complete. The chapter on calculation of diets is clear and well done. Other chapters in this section include one page discussions on the utilization of food and food exhibits. The concluding chapter provides the reader with some useful miscellaneous data that are not often found in the average textbook of nutrition. The fifth section is an appendix wherein one finds the most modern methods of evaluating the nutritional status of the patient, including vitamins. The chapter on commercial vitamin products is a practical and useful compilation of facts. The chapter on food hazards is well outlined. The concluding chapters are on recipes and food suggestions for special conditions and special diet instruction sheets. The bibliography after each chapter in the book is current and authoritative. The work is in reality a handbook which contains an adequate amount of epitomized descriptive material on each phase of nutrition. The authors have done an excellent job of editing and organizing. The material is conveniently presented in a concise, simple and practical manner. It is distinctly original and can be purchased with profit by those whose libraries are complete with textbooks on the subject of nutrition. The physician as well as the nutritionist and the dietitian will find the book most useful. It is an excellent reference work for the library of hospitals and medical schools on the subject of nutrition. Few textbooks on this subject contain such a wealth of facts and useful data.

Experimental Investigations in Serum Allergy with Reference to the Etiology of Rheumatic Joint Diseases. By Egon Bruun. Translated from Danish by Mrs. Clara Packness. Denne Afhandling er af det lægevidenskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad, København, 1939. Paper. Price, 24 Danish kroner. Pp. 229, with 49 illustrations. Copenhagen: Einar Munksgaard; London: Oxford University Press, 1940

This book details the results of four years of research work in Copenhagen by Bruun, who attempted to corroborate the animal experiments of Klinge and others on "serum allergy" (inflammatory reactions in various tissues of animals sensitized to horse or other serum and treated with subsequent doses of the same serum). Of late a number of German and American workers have supported the hypothesis that allergy somehow takes part in the causation of chronic polyarthritis as well as rheumatic fever. Beginning in 1929, Klinge sensitized animals with subcutaneous injections of protein (fresh horse serum) and subsequently injected the antigen into knee joints of rabbits, producing in joints, heart, muscles, liver and other tissues lesions considered analogous to those of human "rheumatism." In the injected (but not in the noninjected) joints, acute phlegmonous and chronic nonsuppurative arthritis were produced; in heart muscle and valves, lesions appeared which included some resembling Aschoff bodies. The reactions varied in different animals depending largely on the number, size and timing of the subsequent doses of antigen. Not dismissing the role of bacteria in the production of human rheumatism, Klinge concluded that rheumatic joint diseases in man probably represent the reaction of allergically sensitive tissues to bacterial proteins.

Bruun has repeated and extended Klinge's experiments. Seventy-five rabbits were sensitized to sterile horse serum; then at varying periods they were subjected to one or more intra-articular injections of the same serum. With minor exceptions Bruun substantiated the results of Klinge. By varying the size, number and spacing of the injections he produced either an acute allergic inflammation (chiefly lymphocytic and not polymorphonuclear as in Klinge's cases) or a subchronic or chronic allergic inflammation not only in the injected joints but also in other tissues—heart, vessels, liver, spleen and muscles. In four animals allergic reactions were also found in the noninjected knee joint, producing what the author called "allergic polyarthritis." Giant cells of the foreign body and not of the Aschoff type participated in the myocardial reactions. In the uncomplicated experiments these inflammatory reactions were almost entirely "lymphohistiocytic" in type, but when short cold applications (ethyl chloride spray) were also applied to joints subjected to the injections of horse serum the resulting inflammation became largely polymorphonuclear, indicating that cold acted as a "parallergen."

Commenting on his results, the author discusses the role of the reticulo-endothelial system in allergic and immune reactions and sets forth the hypothesis that the large mononucleated or multinucleated, nonspecific, allergic macrophage giant cells, which

arise from normal resting histiocytes, proceed under specific influences to develop into different giant cell forms characteristic of the influence which provokes them. Thus, if an allergic giant cell is influenced by Koch's bacillus it will be converted into a giant cell of the Langerhans type; if the allergic macrophage giant cell is influenced by small tissue necrosis (such as may result from cold applications) there will probably appear a foreign body giant cell, and if it is influenced by streptococci there will probably appear an Aschoff giant cell.

In conclusion the author indicates a number of far reaching points of resemblance between sero-allergic tissue reactions in experimental animals and the pathologic changes encountered in rheumatic patients. Complete agreement between the results of experiments on serum allergy and human rheumatism cannot be expected, because in animal experiments nonbacterial allergy is purposely applied in order to determine the importance of the allergic factors, whereas in human beings it must be presumed that both the sensitizing and the provoking doses of antigen originate from bacteria. Although conclusive proof is not yet available, Bruun considers it probable that rheumatic joint diseases (that is, rheumatic fever and certain forms of polyarthritis) result from the action of bacteria (probably streptococci) in an allergically changed organism.

The report represents a great deal of careful painstaking work and should not be lightly regarded even by those who, in the current tradition, scoff at the widening application of "allergy." The author is obviously and somewhat annoyingly vague in his use of the terms "rheumatic diseases," "rheumatism" and "polyarthritis," but probably he is purposely vague as thereby he does not have to limit his vision prematurely. Since both myocardial lesions and chronic inflammatory lesions in joints (with pannus formation and partial ankylosis) were produced, the reader is permitted to infer that, if the author's hypothesis is valid, human rheumatic fever and chronic deforming polyarthritis may be rather closely related.

The author describes the technic used and the lesions produced in careful detail, perhaps in too much detail. There is a summary at the end of each of the five main chapters and another at the end of the book. Some condensation and less reiteration would have been possible without loss to clarity. The book is illustrated with excellent photomicrographs; had they been inserted in their appropriate and separate places rather than bound together toward the end of the book it would have been easier for the reader. About forty pages is given over to extracts from the animal necropsy records. A bibliography of 213 references is appended.

This study would have found a larger audience and been more readily available had it been published in an American or English medical journal devoted to experimental medicine or pathology. Those readers who will search for it in its present form will find it thought provoking and worthy of their serious consideration.

Surgery of the Hand: Wounds, Infections and Closed Traumata: A Book for the Practitioner and the Surgeon. By Marc Iselin, M.D., Surgeon, The American Hospital, Paris. Translated by T. M. J. d'Offay, M.B., Ch.B., F.R.C.S., Surgeon and Deputy Medical Superintendent, City General Hospital, Leicester, and Thomas B. Mouat, M.D., Ch.M., F.R.C.S., Surgeon, The Royal Infirmary, Sheffield, England. Cloth. Price, $5.50. Pp. 353, with 135 illustrations. Philadelphia: Blakiston Company, 1940.

This translation brings to English and American students and practitioners Iselin's ideas on the treatment of injuries and infections of the hand and represents a serious attempt to raise the standards of treatment of injuries and infections of the hand. At the outset, in emphasizing the importance of the subject the author cites a number of cases of obviously neglected and badly treated cases. One wonders, however, whether French surgical practice is quite as casual and ill considered as one might conclude from the cases described. Chapters on tetanus and trophic and painful sequelae of hand injuries and a section on acute spreading infection have been added to the previous edition. The revised discussion of the treatment of wounds shows the marked influence of Böhler's teachings. The author's discussion of wounds loses some of its effectiveness in the manner of its presentation. Wounds due to aniline pencils, subungual hematoma, wounds with bone lesions and division of tendons are grouped in a single chapter on wounds of the fingers, wounds of the thumb in another, and wounds of the hands in a third—divided into wounds of thenar eminence, middle palmar region and so on. As a result of this confusion one has difficulty in obtaining a clearcut notion of the author's ideas concerning the proper treatment of uncomplicated injuries of soft tissues, tendon injuries or nerve division. Taken as a whole, this volume represents an unusually wide experience and serious interest in the subject of hand injuries and infections. It deserves whole hearted commendation.

Embalming Fluids: Their Historical Development and Formulation, from the Standpoint of the Chemical Aspects of the Scientific Art of Preserving Human Remains. By Simon Mendelsohn, F.A.I.C., Consulting Chemist, Cincinnati, Ohio. Cloth. Price, $4. Pp. 166, with 8 illustrations. New York: Chemical Publishing Co., Inc., 1940.

The author has compiled an interesting and authoritative book, probably the first of its kind, for the practicing mortician. The subject matter includes a review of the historical development of embalming, some phases of the chemistry of putrefaction, the action, formulation and compounding of embalming fluids, the chemical and physical properties of preservatives, a few analytical methods, the determination of the phenol coefficient, a digest of jurisdictional regulations and a digest of American patents for embalming preparations. Some of the material has been obtained from antiquated and obsolete textbooks such as Barnes's Art and Science of Embalming (Chicago, 1905). An interesting section is that on the selective absorption of formaldehyde by different tissues, which has been taken from the master's thesis of G. M. Sleichter (University of Cincinnati, 1939). Much of the organic and analytical chemistry is beyond the scope of the average mortician. Physicians, especially pathologists, and public health workers would be interested in the data involving the preservation of bodies, the effect of chemicals on the bodies and the regulations in various states for the embalming and the transportation of bodies. The book is recommended to every practicing mortician, not for the purpose of having him prepare his own chemicals, but rather to give him a more complete understanding of the chemicals he uses.

Rheumatic Fever: Studies of the Epidemiology, Manifestations, Diagnosis, and Treatment of the Disease During the First Three Decades. By May G. Wilson, M.D., The New York Hospital and Department of Pediatrics, Cornell University Medical College, New York City. Cloth. Price, $4.50. Pp. 595, with 79 illustrations. New York: Commonwealth Fund; London: Oxford University Press, 1940.

This is a record of the extensive experiences of the author with rheumatic fever and all its protean manifestations. Dr. Wilson has been a diligent student of this disease for more than twenty years and has had extensive and intimate clinical experience in heart clinics, wards and convalescent homes. The book is replete with observations and data that are seldom found in a textbook. While much of the material is distinctly original, the author has drawn on current contributions to enhance her discussions. The volume is organized into five parts and each part has a carefully selected bibliography. Part I is a brief but interesting historical survey of the subject and an excellent discussion of the epidemiology and etiology of the disease. Original investigations of Dr. Wilson and her collaborators relative to the etiology of rheumatic fever are recorded in some detail. Part II comprises a detailed discussion of the clinical and pathologic manifestations of rheumatic fever in childhood. The author presents numerous tables and graphic summaries to support and epitomize the text. Part III is a discussion of the course of the disease in the first three decades of life and concerns itself particularly with prognosis. As the basis for this discussion, 547 case records have been observed and critically analyzed. Her ingenious graphic presentation of data facilitates this presentation considerably. Part IV is a discussion of the diagnosis and functional classification of heart disease in children and part V is a discussion of the management of rheumatic fever with treatment and convalescent care receiving special emphasis. At the end of the book is a wealth of useful data arranged in tabular form on geographic incidence of the disease, epidemiologic and genetic analyses of rheumatic fever families, summaries of experimental protocols, technics of laboratory methods, values for red and white cells in children, blood pressure readings, Addis counts and special measures in nursing care and diets. While the author did not intend to write

a textbook or critical review of the subject, she has succeeded in presenting the reader with one of the most comprehensive and authoritatively documented discussions of the disease in print. The work reflects not only the painstaking and disciplined approach to the study of this disease but also a sound and critical evaluation of an immense amount of clinical and laboratory data. Dr. Wilson and her collaborators are to be congratulated for this contribution. It is a current source of facts about rheumatic fever in all its phases that should be eagerly sought by every practicing physician. This is a book that should be in every medical library.

Physiology of Micturition: Experimental and Clinical Studies With Suggestions as to Diagnosis and Treatment. By Orthello R. Langworthy, Lawrence C. Kolb and Lloyd G. Lewis. Cloth. Price, $3.50. Pp. 232, with 49 illustrations. Baltimore: Williams & Wilkins Company, 1940.

After reviewing the anatomy of the bladder with particular reference to the nerve supply the authors present the evidence which has accrued during the past several decades with regard to the physiology of urination. The experimental work of others is discussed and the additional data which these collaborators have acquired from their own efforts is presented in detail. Throughout the text numerous illustrative case reports are given which include important cystometrographic evidence. Disturbances of urination of neurogenic origin are described in detail and theories as to the cause of the various symptoms presented by the particular type of case are advanced. A brief summary follows each chapter, emphasizing the important points which have been treated. This should serve as a valuable reference work for both advanced students and those urologists interested in learning more about the patient with obscure physiologic disturbance of the bladder mechanism.

Oral Surgery. By Sterling V. Mead, D.D.S., M.S., B.S., Second edition. Cloth. Price, $12.50. Pp. 1,315, with 560 illustrations. St. Louis: C. V. Mosby Company, 1940.

This is the companion volume to Mead's Diseases of the Mouth, in which an attempt is made to treat oral disease from the surgical point of view. To this end the author discusses oral bacteriology, surgical technic, the sterile field, anatomic relations and other pertinent material. Adequate discussions are given of methods of extracting teeth, the treatment of fractures of the jaws, infections involving the mouth and neck and other items of interest in this field. One criticism may be directed toward this work, a defect which it shares in common with Mead's Diseases of the Mouth. The text is too long, it is too verbose and the author has an unhappy facility for complicating discussions of treatment with direct quotations from the current literature. This occupies an unnecessary amount of space, making the text unwieldy and difficult to read. Following each chapter is an extended bibliography, but many of the references cited are incorrectly spelled or misquoted. This careless handling of the bibliographic material greatly reduces the usefulness of the book for students. The volume is profusely illustrated with drawings and roentgenograms which are helpful. The book should be of interest to dentists, oral surgeons and others engaged in treating the diseases of the mouth and jaws.

Specific and Special Reactions for Use in Qualitative Analysis With Particular Reference to Spot Test Analysis. By F. Feigl, Ph.D., Consulting Chemist at the Research Laboratories for Fine-Chemicals, Nourypharma, Denventer. Translated from a revision of the third German edition by Ralph E. Oesper, Ph.D., Professor of Analytical Chemistry at the University of Cincinnati, Cincinnati. Cloth. Price, $3.50. Pp. 192. New York: Nordemann Publishing Company, Inc.; Amsterdam: Elsevier Publishing Company, Inc., 1940.

This is an excellent treatise on the theoretical considerations involved in the qualitative recognition of inorganic elements. The book is produced as a companion volume to the practical part by the same author, "Qualitative Analyse mit Hilfe von Tupfelreaktionen," which has been translated into English. Likewise this work is an English translation of the third German edition together with some material from the forthcoming fourth German edition. This volume contains no technics utilized in qualitative analyses but discusses from a theoretical point of view the various factors affecting the sensitivity and specificity of reactions employed to recognize inorganic elements by the use of spot tests. Subjects such as types of complex chemical compounds, masking of reactions, enhancement of reactivities, the effect of certain atomic groupings on specific activity and solubility, capillary phenomena and fluorescence analysis are taken up under chapter headings. To the student and teacher of qualitative micro-analysis this volume should be most welcome and helpful. Many suggestions can be obtained which will be of service in developing new tests—micro spot tests in nature—for the recognition of certain inorganic constituents in the presence of contaminants. Considerable discussion is given concerning organic complexes containing inorganic elements. This field is most promising not only qualitatively but also in quantitative analysis, as is manifest by the numerous quantitative technics now employing this behavior. The final chapter on fluorescence analysis gives many suggestions for further investigation. This is particularly fortunate, since this field promises to be quite fruitful to those interested in biometric assay problems. This book seems of value to the pure analyst rather than to the clinician or clinical pathologist. However, the toxicologist will find many useful theoretical considerations of spot tests which he may find advantageous. The volume contains an excellent bibliography and is free from typographic errors.

Standard Methods of the Division of Laboratories and Research of the New York State Department of Health. Augustus B. Wadsworth, M.D., Director. Second edition. Cloth. Price, $7.50. Pp. 681, with illustrations. Baltimore: Williams & Wilkins Company, 1939.

The first edition of this work was widely accepted as a practical and dependable source of information on general and special technical laboratory procedures as used in the various branches of the Division of Laboratories of the New York State Department of Health. The second edition maintains this high standard with the addition of the new quantitative technic in the complement fixation tests, the revised colloidal gold test and new methods in the production, concentration and standardization of certain therapeutic serums. The book still remains one of the most current comprehensive and authoritative sources of information on laboratory methods in print and should be in the library of every health department laboratory and medical library.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Gastric Ulcer Allegedly Resulting from Burns.—In the course of his employment, May 8, 1937, Fickbohm, who was about 29 years old and in good health, washed a motor with kerosene. The kerosene ignited and Fickbohm suffered second degree burns of the forehead and arms, and third degree burns of the chest, face, ears, hands and shoulders. He received medical and hospital care and returned to work July 1, continuing at work until October 23. There was evidence, however, that during that period he was subject to fainting spells, that he coughed and spit up blood, that at various times he had to stay away from work and that his condition became progressively worse. On October 23 he quit work and went to Colorado to recuperate. On his return home again the following spring his condition seemed worse. April 2, 1938, he submitted to an operation, which revealed the fact that he was suffering from a perforated gastric ulcer. Four days later he died, the immediate cause of death, according to the attending physician, being diffuse peritonitis and bronchopneumonia. His legal heirs brought proceedings under the workmen's compensation act of Iowa to recover compensation for his death, basing their claim, apparently, on the theory that the burns received in the course of employment caused the ulcer and the peritonitis, which resulted in death. The district court, Woodbury County, Iowa, affirmed an award of compensation rendered by the industrial commissioner, and the employer and his insurance carrier appealed to the Supreme Court of Iowa.

From the expert testimony, said the Supreme Court, adduced at the hearing before the commissioner, it appears that gastric

ulcers as a result of external burns are of infrequent occurrence and do not often come to the attention even of experienced and busy practitioners. None of the physicians testifying at the trial, however, denied that this form of ulcer might follow external burns, although they stated that such a result occurred in only a small percentage of cases. Two physicians testified that in their opinion the probable cause of the ulcer and death was the burns, while four physicians were of a contrary opinion. The condition of the workman, as testified to both by lay witnesses and by the attending physician, exhibited symptoms which are those of an ulcer, and this fact was not disputed by any medical witness. There was evidence that when gastric ulcers are due to burns such burns create "a toxic condition which passes through the blood and affects the organs of the body." There was a contradiction in the expert testimony as to the time when such ulcers will develop, as well as to the ultimate fact—the cause of death. But from these contradictory opinions, continued the Supreme Court, and in consideration of all the testimony, the commissioner concluded that death was caused by the burns, in the course of and arising out of the employment. This finding, if based on disputed questions of material fact, was conclusive on this court.

The Supreme Court accordingly affirmed the award of compension.—*Fickbohm v. Ryal Miller Chevrolet Co. (Ia.), 292 N. W. 801.*

Medical Practice Acts: Pardon No Bar to Subsequent Proceedings to Revoke Physician's License.—In November 1929 the plaintiff, a licensed physician in the state of Florida, was convicted in a Florida court of perjury, possession of stolen goods and grand larceny and was sentenced to imprisonment in the state penitentiary for five years. In March 1933 he was granted a full and complete pardon for such offenses by the board of pardons of Florida. Subsequently the defendant, the state board of medical examiners of Florida, commenced proceedings to revoke the plaintiff's license to practice medicine on the ground that he had been convicted of a felony. The plaintiff thereupon petitioned the Supreme Court of Florida for a writ of prohibition to restrain the defendant from continuing the revocation proceedings. The board then filed a demurrer to the petition.

The plaintiff contended that his full and complete pardon constituted a complete defense to the revocation proceedings and deprived the board of all jurisdiction to conduct further hearings in the matter. The modern trend of authorities, said the Supreme Court, is that a pardon restores one to the customary civil rights ordinarily belonging to a citizen of the state, i. e., the right to hold office, to vote, to serve on a jury and to be a witness, but it does not restore offices forfeited nor property or interests vested in others in consequence of the conviction. Section 8495, Comp. Gen. Laws of Florida, 1927, specifically provides that a person receiving a full pardon shall be entitled to all the rights of citizenship enjoyed by him before his conviction. The rights of citizenship, however, do not include the right to practice medicine and, said the court, we have been unable to find a decision by a court of last resort holding that a full and complete pardon restores the extraordinary right to practice any of the professions. The privilege of pursuing the practice of a profession, continued the court, is based on the granting of a license by a sovereign state, which license is granted only to those possessing the necessary integrity and approved moral character. The power of the Florida legislature to require, as a condition precedent to the practice of medicine, that the practitioner not only be learned in his profession but possess qualifications of honor and good moral character cannot be questioned. Likewise, it was a proper exercise of its power for the legislature to provide for the revocation of the license of a practitioner of medicine who has been convicted of a felony in the courts of Florida. The adjudication of a medical practitioner's guilt of felony renders him a man of such character as to render it unsafe to trust the lives and health of the citizens of this state to his professional care. The doors of our homes should not be opened to receive men who hold themselves out as qualified medical practitioners when in truth and fact they have been convicted of crime. Therefore, since the pardon in the instant case merely returned the plaintiff to the rights of citizenship which he previously had, and since those rights did not necessarily include the right to practice medicine, the court held that the effect of the pardon should not be construed or extended to abrogate the provisions of the medical practice act, requiring moral qualifications of medical practitioners, by restoring to the plaintiff a license which he was no longer morally qualified to retain. Accordingly, the court sustained the defendant's demurrer and denied the plaintiff's petition for a writ of prohibition.—*Page v. Watson et al. (Fla.), 192 So. 205.*

Evidence: Admissibility of Results of Chemical Tests for Alcoholic Intoxication.—The defendant was prosecuted for operating a motor vehicle while under the influence of intoxicating liquor. Over the objection of the defendant, the trial court admitted in evidence the results of chemical analyses of the defendant's urine and blood which had been made to determine the quantity of alcohol, if any, in those body fluids. On the basis of this evidence the defendant was convicted of operating a motor vehicle while in an intoxicated condition, and he appealed to the Supreme Court of Iowa.

The defendant contended that the effect of the admission in evidence of the results of the chemical tests for alcoholic intoxication was to compel him to be a witness against himself in that he had been compelled to give the specimens of blood and urine against his will. This contention, however, did not meet with the approval of the Supreme Court. Although the circumstances under which the specimens of blood and urine were obtained were not described in the published report, the court held that there was no evidence whatever of either compulsion or entrapment. In fact, said the court, the evidence showed that the defendant voluntarily gave the specimens in the hope that the results obtained by analysis would demonstrate that he was not intoxicated and thus free him from the charge brought against him. Accordingly, the judgment of conviction was affirmed.—*State v. Morkrid (Iowa), 286 N. W. 412.*

Workmen's Compensation Acts: Student Nurse an Employee.—In the opinion of the Supreme Court of Wisconsin, a student nurse who pays the hospital where she is to receive her training a nominal entrance fee and a determined amount for books and uniforms to be used during the training period, who must render certain services to the hospital during that period and who is furnished board, room and laundry by the hospital is an employee of the hospital. An injury to such a student nurse arising out of and in the course of such employment, consequently, is compensable under the workmen's compensation act of Wisconsin.—*Employers Mut. Liability Ins. Co. v. Industrial Commission (Wis.), 292 N. W. 878.*

Society Proceedings

COMING MEETINGS

American Society of Anesthetists, New York, Dec. 12. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.

American Student Health Association, Ann Arbor, Mich., Dec. 27-28. Dr. Ralph I. Canuteson, University of Kansas, Lawrence, Kan., Secretary.

Annual Congress on Industrial Health, Chicago, Jan. 13-15. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago, Secretary.

Eastern Section, American Laryngological, Rhinological and Otological Society, Philadelphia, Jan. 10. Dr. N. S. Weinberger, Robert Packer Hospital, Sayre, Pa., Chairman.

Puerto Rico, Medical Association of, San Juan, Dec. 13-15. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.

Radiological Society of North America, Cleveland, Dec. 2-6. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.

Society of American Bacteriologists, St. Louis, Dec. 27-29. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

Southern Section, American Laryngological, Rhinological and Otological Society, Nashville, Tenn., Jan. 8. Dr. William G. Kennon, Doctors Bldg., Nashville, Tenn., Chairman.

Southern Surgical Association, Hot Springs, Va., Dec. 10-12. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Western Surgical Association, Topeka, Kan., Dec. 6-7. Dr. Albert H. Montgomery, 122 South Michigan Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

200:429-576 (Oct.) 1940. **Partial Index**

Medical and Social Approaches to the Problem of Chronic Rheumatism. R. B. Osgood, Boston.—p. 429.
"Target Cell" Anemia: Anerythroblastic Type of Cooley's Erythroblastic Anemia. W. Dameshek, Boston.—p. 445.
Anemia and Water Retention. M. B. Strauss and H. J. Fox, Boston.—p. 454.
Failure to Control Polycythemia Rubra Vera with Lipocaic and Choline. G. Carpenter, Chicago.—p. 462.
Blood Pressure Determinations by Patients with Essential Hypertension: 1. Difference Between Clinic and Home Readings Before Treatment. D. Ayman and A. D. Goldshine, Boston.—p. 465.
Delayed Electrocardiographic Changes in Coronary Occlusion. S. Strauss, Chicago.—p. 474.
Cardiac and Respiratory Function at Rest in Patients with Uncomplicated Polycythemia Vera. M. D. Altschule, Marie C. Volk and H. Henstell, Boston.—p. 478.
Manometric Determination of Effects of Various Sulfanilamide Compounds on Brucella Melitensis. W. Kempner, B. Wise and C. Schlayer, Durham, N. C.—p. 484.
Penetration of Blood Clot by Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfamethylthiazole. C. N. Duncan and J. M. Faulkner, Boston.—p. 492.
Thrombocytopenic Purpura Due to Sulfapyridine. H. K. Russell, White Plains, N. Y., and R. C. Page, New York.—p. 495.
Postpubertal Menorrhagia and Its Possible Relations to Thrombocytopenic Purpura Haemorrhagica. H. L. Goldburgh and B. A. Gouley, Philadelphia.—p. 499.
*Acute Nephritis: Review of Seventy-Seven Cases. J. M. Hayman Jr. and J. W. Martin Jr., Cleveland.—p. 505.
Evaluation of Brucella Opsonocytophagic Test. B. Wise, Durham, N. C.—p. 520.
Intubation Studies of Human Small Intestine. W. G. Karr, W. O. Abbott, Olive D. Hoffman and T. G. Miller, Philadelphia.—p. 524.
*Clinically Associated Deficiency Diseases. T. D. Spies, A. P. Swain and Jean M. Grant, Cincinnati.—p. 536.
Vitamin C in Epilepsy: Dilantin Sodium Not a Cause of Vitamin C Deficiency. H. H. Merritt and Althea Foster, Boston.—p. 541.

Acute Nephritis.—Hayman and Martin maintain that the conception of acute glomerular nephritis as a disease of children which follows severe infections, especially scarlet fever, and is characterized by albuminuria, hematuria, edema and convulsions has been shown to be inadequate. While acute nephritis is more common in children than in adults, it may occur at any age. Moreover, not only is the prognosis more serious in the older age groups but the onset is frequently more insidious and the symptoms less dramatic. The authors describe the symptoms and clinical course of seventy-seven cases of acute glomerular nephritis treated in Lakeside Hospital from 1931 to 1939. All age groups were represented. A history of preceding infection was obtained in seventy-five of seventy-seven cases. Infection of the upper respiratory tract, sinuses and ears accounted for fifty-six (75 per cent). While the disease occurs at all ages, it is most common before 30. The cardinal symptoms of hematuria, hypertension and edema were not all present in every case. Evidence of cardiac involvement was present in approximately half the cases. Ten patients died in the hospital, seven (9 per cent) primarily of acute nephritis. Fifty-two of the remaining sixty-seven patients were followed for from six months to eight years. Of these thirty-five (67.3 per cent) are well, nine (17.3 per cent) have persistent albuminuria or hypertension, while three have died of uremia since discharge from the hospital, and five have chronic glomerular nephritis.

Clinically Associated Deficiency Diseases.—Spies and his associates report observations on 1,250 malnourished persons. The subjects were selected from persons presenting themselves for examination either at the Hillman Hospital, Birmingham, Ala., or the General Hospital, Cincinnati. The patients made frequent visits to the clinic, during which they were weighed and examined. Diagnosis of a specific deficiency state was based on the presence of symptoms characteristic of it. Thus diagnosis of pellagra was made only if characteristic mucous membrane lesions, dermal lesions or both were present; diagnosis of riboflavin deficiency depended on the presence of characteristic angular lesions of the mouth, or ocular symptoms; diagnosis of beriberi was made only in the presence of nutritional neuritis. The diagnosis in each instance was confirmed by the response of the patient to the specific therapeutic agent administered under controlled conditions. In general, the method of confirmation consisted in the dramatic response to the administration of synthetic nicotinic acid or its compounds, synthetic riboflavin, synthetic thiamine hydrochloride or synthetic vitamin B_6, the patient's diet remaining constant. Many of these patients had other diseases, such as scurvy, which was treated with synthetic ascorbic acid, and vitamin A deficiency, which responded to carotene or oleum percomorphum. That many of these persons must suffer from general malnutrition even though they have no symptoms of a specific deficiency disease is indicated by an analysis of the dietaries of fifty cases which shows that they are deficient to some extent in each of the essential nutrients. These patients have mixed rather than single deficiency disease, and months and years of ill health precede the diagnostic lesions of a specific deficiency. The authors believe that the confusion regarding vitamins or deficiency diseases is partly due to the discovery that vitamin B, formerly considered a single substance, is composed of twelve or more separate factors, each, together with unknown substances, contributing to the total effect of therapeutic agents such as yeast, wheat germ or liver extract. Although the administration of a single chemical substance was followed by a response of the lesion for which it was specific and by a great increase in the patients' strength, the improvement in general was greater when they were given a number of synthetic materials than when they were given any one alone. Furthermore, when supplements of dried brewers' yeast powder or liver extract were given in addition to synthetic materials to persons who continued to eat their usual inadequate diets, there was an even greater improvement in their general health.

American J. Obstetrics and Gynecology, St. Louis

40:361-544 (Sept.) 1940. **Partial Index**

Retrodisplacement of Uterus in Relation to Pregnancy, with Special Reference to Technic and End Results of Bissell Operation. A. H. Aldridge, New York.—p. 361.
Method for Evaluating Stress of Urinary Incontinence. A. C. Barnes, Ann Arbor, Mich.—p. 381.
Uterine Bleeding Induced by Progesterone: During Normal Menstrual Interval and in Amenorrhea. B. Zondek, Jerusalem, Palestine; S. Rozin and M. Vesell, New York.—p. 391.
Calcium, Phosphorus and Nitrogen Metabolism in Women During Second Half of Pregnancy and Early Lactation. F. W. Oberst, Lexington, Ky., and E. D. Plass, Iowa City.—p. 399.
Effect of Vitamin K Administered to Patients in Labor. J. E. Fitzgerald and Augusta Webster, Chicago.—p. 413.
*Coincidence of Tuberculosis of Endometrium with Tuberculosis of Lung. J. E. Lackner, W. Schiller and A. S. Tulsky, Chicago.—p. 429.
*Pelvic Tuberculosis: Report of Case of Tuberculosis of Cervix. A. H. Lahmann and S. F. Schwartz, Milwaukee.—p. 439.
Clinical Study of Effects of Diethylstilbestrol on Puerperal Women. H. F. Connally Jr., D. I. Dann, J. M. Reese and L. H. Douglass, Baltimore.—p. 445.
Intra-Uterine Onset of Hemorrhagic Disease of Newborn. C. T. Javert, New York.—p. 453.
Studies on Preservation of Placental Blood. J. Scudder, C. R. Drew and V. G. Damon, New York.—p. 461.
Effect of Salt Poor Diet During Pregnancy on Duration of Labor. W. Pomerance and I. Daichman, Brooklyn.—p. 463.
Acute Intestinal Obstruction Complicating Pregnancy and Postpartum Period: Report of Four Cases. F. Weintraub and B. Jaffe, Brooklyn.—p. 481.
Velamentous Insertion of Umbilical Cord: Cause of Fetal Death in a Twin Pregnancy. J. W. Records, Oklahoma City.—p. 504.
Paraldehyde Analgesia and Perineal Anesthesia in Obstetrics. C. K. Fraser and J. W. Jones, Durham, N. C.—p. 506.
Bilateral Fibroma of Ovaries Combined with Degenerating Adenoma of Right Breast. Eva Haumeder, New Hampton, Iowa.—p. 514.
Viable Triplets Delivered by Cesarean Section. L. Smith and D. Cathcart, Atlanta, Ga.—p. 515.

Coincidence of Tuberculosis of Endometrium and Lung.—Lackner and his associates studied the endometrium of 125 women suffering from pulmonary tuberculosis. Clinically two groups of tuberculous endometritis can be distinguished. The first is involvement associated with progressive

tuberculosis of the ovaries, the tubes or both. The endometritis represents only an associated pathologic process of minor clinical importance. The second is tuberculosis of the endometrium with normal tubes and ovaries, associated with and developing from a tuberculous infection of an organ outside the pelvis, such as the lungs and lymph nodes. This represents an important and obviously unsuspected syndrome of primary extragenital tuberculosis. It is in the latter group that the authors tried to determine how often women with primary progressive tuberculosis of the lungs would show an isolated clinically latent tuberculosis of the endometrium. Only women with evident progressive tuberculosis of the lungs, with no clinically manifest inflammatory process of the ovary or tube, were examined. Only two cases of manifest primary endometrial tuberculosis were found among the 125 women. The history and clinical observations of these two cases are meager and resemble that of most of the cases of tuberculous endometritis gleaned from the literature. Both patients apparently had normal or almost normal menstrual cycles. They had no gynecologic complaints. Vaginal examination was negative in one case and it elicited minimal changes in the other case. The incidence of two cases among 125 harmonizes with the figures obtained from the necropsy records of the Cook County Hospital during the last ten years. The incidence in the necropsy material was 1.87 per cent as compared with 1.6 per cent in the clinical material. The authors use Ghon's classification. In the first type with endogenous spread a generalized infection, with the local tuberculosis representing only a part of the generalized infection, must be distinguished from an isolated hematogenic focus or metastasis. The second type of endometrial tuberculosis represents "reinfection" and is represented by cases of a new infection in some other organ after a primary focus has developed in one organ. The two cases reported are classified as isolated metastasis of a primary pulmonary process. By exclusion the hematogenic route must be accepted as the method of spread. It may be similar to the spread of miliary tuberculosis, the difference being that the circulating tubercle bacilli found the endometrium the only favorable nidus. An example of this type of secondary tuberculosis is hematogenic salpingitis. The authors believe that the occurrence of an isolated hematogenic tuberculous endometritis would appear to be proved by the observations in their two cases.

Pelvic Tuberculosis.—Lahmann and Schwartz believe that tuberculous involvement of the female genitalia is more prevalent than is generally assumed. It has been estimated as constituting from 5 to 8 per cent of all pelvic inflammatory conditions and therefore should be considered in the differential diagnosis of any disorder of the female genitalia. Symptoms and signs are not typical and resemble those of many other maladies affecting the genitalia. Genital tuberculosis is usually secondary to tuberculosis elsewhere in the body and occurs most frequently during active sexual life. There is a marked tendency for the disease to descend from the tubes to the endometrium, involving the tubes in 90 per cent, endometrium in 75 per cent, ovaries in 30 per cent, cervix in 5.5 per cent and vagina and vulva in 0.5 per cent. There is no tendency for the disease to spread to the urinary tract. During a period of eleven years twenty-one women with tuberculosis involving the genitalia were admitted and treated at the Milwaukee County General Hospital. Positive evidence for the diagnosis could not be obtained in six instances as no tissue was available for microscopic study, and these have been excluded from discussion. Twelve of the fifteen were between 20 and 30 years of age. The oldest patient was 43. Not even in one instance was the diagnosis of genital tuberculosis correctly made or even considered preoperatively. In only one case was the diagnosis made by the operating surgeon. Symptoms of tuberculosis of the female genitalia resemble those of chronic gonorrheal salpingitis. The two most common complaints were pain in the lower part of the abdomen confined to one or both sides, and vaginal discharge, usually of long standing. Other symptoms in their order of frequency were loss of weight, urinary distress, vomiting, weakness, cough, abdominal mass, fever and chills. Eight patients are alive and well, including one on whom a right salpingo-oophorectomy was performed in 1930 when the patient was 27 years old. Four patients could not be located and the remaining three are known to be dead. There was a high incidence of immediate postoperative complications. The most serious of these was draining sinuses from the incision, many fecal in character and of long standing. Sinuses which drained from approximately four months to four years developed in eight patients. Six of the surgical incisions healed primarily. Pelvic tuberculosis, according to the authors, may be spread by (1) contiguity, from the soft tissues adjoining the pelvis, (2) lymphogenically, usually from the abdominal cavity, (3) hematogenically, from some distant focus and (4) primarily, with direct inoculation by coitus. The only case of tuberculosis of the cervix (probably primary) that was encountered is cited. Pulmonary involvement was encountered in 20 per cent of the patients.

Anesthesiology, New York

1:121-240 (Sept.) 1940

Water Exchanges Due to Anesthetic Drugs. H. G. Barbour, New Haven, Conn.—p. 121.
*Bronchopneumonia: Anesthetist's Responsibility? R. M. Waters, Madison, Wis.—p. 136.
Intravenous Anesthesia. J. S. Lundy and R. C. Adams, Rochester, Minn.—p. 145.
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Production of Ventricular Tachycardia by Adrenalin in Cyclopropane Anesthesia. C. R. Allen, J. W. Stutzman and W. J. Meek, Madison, Wis.—p. 158.
Laboratory Studies on Prophylaxis and Treatment of Ventricular Fibrillation Induced by Epinephrine During Cyclopropane Anesthesia. C. L. Burstein, B. A. Marangoni, A. C. DeGraff and E. A. Rovenstine, New York.—p. 167.
Oxygen Therapy and Resuscitation. E. H. Warnock and R. M. Tovell, Hartford, Conn.—p. 187.
Duration of Local Anesthesia in Relation to Concentrations of Procaine and Epinephrine. A. J. Leser, Los Angeles.—p. 205.
*Hyperthermia Following Anesthesia: Consideration of Control of Body Temperature During Anesthesia. G. E. Burford, New York.—p. 208.
Endotracheal Nitrous Oxide Anesthesia for Tonsillectomy: Report of 1,550 Cases. K. C. McCarthy, Toledo, Ohio.—p. 216.

Bronchopneumonia.—Waters believes that with rare exceptions pulmonary morbidity follows a period of interference with normal respiration whether due to drugs, trauma or illness. Many of the signs and symptoms seen in patients depressed by illness or trauma are also observed as side effects of drugs administered to relieve pain. Illness, injury and pain therapy may interfere with normal breathing by interfering with the normal innervation, psychic activity, muscle tone, activity of the respiratory center and inhaled atmospheres. Improvement in the incidence of pulmonary morbidity lies along the line of preventing these complications and not in the treatment of bronchopneumonia after it is established. So far the occasional occurrence before, during and after anesthesia of a period of interference with normal respiration has not been prevented. Patients are still encountered who after operation, after sedative and narcotic drug administration, after head injuries or even during debilitating illness have atelectasis, massive collapse, bronchopneumonia and other major respiratory disease. Delay in the care of abnormally functioning respiration is fatal. Changes in pulse rate, respiration, blood pressures and body temperature afford earlier evidence of the onset of trouble than do cyanosis and auscultatory or percussion evidence. Such changes can be masked by oxygen therapy. Careful inspection of the respiratory movements viewed from the foot of the bed, laterally and from the head may make evident the asymmetry which is the cardinal sign of atelectasis. Similar management has been useful for prophylaxis and therapy. All markedly depressed patients should be treated by the "stir-up regimen." This means the hourly insistence on making the patient take several deep breaths and cough effectively, and changing his position radically. Active aid and encouragement by the attendant is required. Frequently a depressed patient with inactive breathing and inefficient or absent cough can be made to expel large quantities of secretion from the air passages. One may cause the unconscious or completely uncooperative patient to take several deep breaths by pouring pure carbon dioxide from a rubber tube held over the face. Such a flow of gas added to the inspired air may force the desired ventilation of inactive alveoli. Carbon dioxide is of therapeutic value for this specific purpose. When there is the slightest evidence of obstruction or of atelec-

tasis, tracheobronchial toilet, aspiration of secretions, is justified. This apparently drastic regimen, when instituted early and faithfully, has reduced the incidence of major respiratory complications and has reduced the severity of many of those still encountered. Markedly depressed breathing must be made adequate either manually or mechanically. Carbon dioxide therapy is not a physiologic remedy for depressed breathing. Oxygen therapy is logical for only half of the picture and may require supplemental augmentation of respiratory exchange to restore normal conditions.

Hyperthermia Following Anesthesia.—Burford encountered three instances of excessive hyperthermia in children following ether anesthesia during hot weather. Frequent records of temperature taken during anesthesia showed numerous moderate but unimportant elevations. They indicate that ether anesthesia, contrary to the opinion widely held, does not lower body temperature. These frequent moderate elevations and the cases of high temperatures suggest that under propitious conditions the factors working toward disturbance of thermal control during anesthesia become accentuated. The rise in temperature to around 108 F. is accompanied by a remarkable elevation of pulse and respiratory rates. One of the author's cases terminated in death. The condition is probably due to the simultaneous disturbance of heat production, heat loss and integration of the activities of the central nervous system related to temperature regulation. The adequate integration of these complex processes between heat production and heat loss requires continuous control by the central nervous system. The control of this diverse activity is centered in the hypothalamus. Abnormalities of heat regulation develop subsequent to lesions at the base of the brain involving the hypothalamus. Specific subdivisions of the hypothalamus control separately heat production and heat distribution. In hot weather, dispersion of heat is accomplished with difficulty, especially in children. Radiation and convection from the skin ordinarily account for the largest part of heat loss. On hot humid days, when the atmospheric temperature approaches the body temperature, the effectiveness of these mechanisms is curtailed. Vaporization from the skin then becomes the chief means of cooling the body. Vaporization during anesthesia meets certain man made impediments. As a result of complete draping during operation, convection and radiation are made more difficult and vaporization can become effective only after perspiration has moistened at least two layers of overlying sheets. The perspiration of a small child may not be sufficient to accomplish this. Vaporization from the skin of the face and from the lungs is impaired by the anesthetic mask and the anesthetist's arm. The administration of ether is associated with a marked adrenergic response, and the internally secreted epinephrine increases tissue metabolism and heat production. Secretion of the thyroid may also be increased through an ultimate effect of an original adrenergic response. This total effect on elevation of temperature achieves significance only through the coexisting impairment of heat distribution. Added to this, the control of the central nervous system on heat regulation may be faulty. Heat regulation in infants and small children is notoriously erratic. This may be related to the immature development of the central nervous system or of certain of its tracts. The three mechanisms of heat control can become affected in the course of anesthesia. The elevated rate of combustion of tissue is possibly aided by struggling during induction. The small rise of temperature is uncompensated. For each rise of 1 degree F. in body temperature, an increase of 7 per cent in the basal metabolic rate occurs. This adds to the production of heat which is already uncompensated. Thus a vicious cycle is established: increased heat causing increased metabolism and increased metabolism producing increased heat. This continues until the cycle is broken. Otherwise high temperatures are attained that produce either permanent damage to the central nervous system or death. The author studied the incidence and direction of changes in temperature of fifty patients during operations performed during the winter under various anesthetic agents and lasting three fourths of an hour or more. There were thirty-three elevations of temperature. Twenty of the elevations were probably no greater than those that normally develop in normal individuals not under anesthesia; however, the five elevations of from 2 to 3 degrees F. are well beyond the normal range. In twenty the rise was less than 1 degree F. and in eight it was from 1 to 1.8 degrees F. Excessive hyperthermia occurs rarely enough to cause great concern, but when infants and children are scheduled for prolonged operations under ether anesthesia during hot weather the possibility of its development should be considered, and axillary temperatures made a part of the anesthesia record might provide a timely warning.

Annals of Internal Medicine, Lancaster, Pa.

14:361-564 (Sept.) 1940

Observations on Effect of Coramine in Certain Cardiac States. W. D. Stroud and P. H. Twaddle, Philadelphia.—p. 361.
Iron Metabolism and Its Relationship to Anemia and Therapy. W. M. Fowler and Adelaide P. Barer, Iowa City.—p. 378.
*Bronchostenosis Complicating Allergic and Infectious Asthma. L. E. Prickman and H. J. Moersch, Rochester, Minn.—p. 387.
*Pharmacologic Treatment in Schizophrenic Patients. S. Katzenelbogen, A. Simon, Anna R. Coyne, C. Vigue and R. Cohn, Washington, D. C.—p. 393.
Anticatalase Activity of Sulfanilamide and Sulfapyridine in Vivo. M. Clyman, Philadelphia.—p. 406.
*Blood Pressure Studies on University Students, Including Effect of Exercise on Essential Hypertension, Hypotension and Normal Subjects. E. A. Thacker, New Orleans.—p. 415.
Treatment of Illness of Emotional Origin by the Internist. E. Weiss, Philadelphia.—p. 424.
Hematologic Aspects of Space Consuming Lesions of Bone Marrow (Myelophthisic Anemia). S. R. Mettier, San Francisco.—p. 436.
Erythema Multiforme Exsudativum (Hebra): Clinical Entity Associated with Systemic Features. H. Keil, New York.—p. 449.
New Observation Helpful in Diagnosis of Coronary Thrombosis. P. J. Steincrohn, Hartford, Conn.—p. 495.
Living with the Weather. F. M. Pottenger, Monrovia, Calif.—p. 502.

Bronchostenosis Complicating Asthma.—Prickman and Moersch believe that bronchostenosis, a definitely localized stricture-like narrowing of a bronchus, is more common than is generally observed. Bronchostenosis is primarily inflammatory and is not referable to allergic edema or bronchial spasm. The lesion inhibits the movement of air entering or leaving the segment of pulmonary tissue beyond the stenosis and retains bronchial secretions below the stenosis, so that an area of partial or complete atelectasis results. Among 140 patients suffering from asthma, examined with the bronchoscope, sixty were found to have definite stenosis of one or more bronchi. A study of these patients showed that bronchostenosis complicating asthma generally produces characteristic symptoms and, frequently, physical and x-ray signs. One prominent symptom is severe, persistent and sometimes paroxysmal cough. At first it is impossible for the patient to raise sputum and when it appears it is profuse, usually mucopurulent and in 40 per cent of the cases is at some time streaked with blood. The severe coughing is apparently caused by the patient's attempt to raise secretions retained by the stenotic area and later, when the stenosis recedes (spontaneously or because of bronchoscopic dilatation) the retained secretions are more easily raised. The sputum is probably blood tinged because of the bronchial inflammation and secondary pulmonary congestion which is present. Febrile episodes, either with or without preceding chills, occurred in 68 per cent of the cases. The fever is explained by the toxicity from the retained secretions and the inflammation. Febrile episodes, hemoptysis or purulent sputum do not accompany uncomplicated asthma and therefore the presence or history of any one of these features in asthma should suggest bronchostenosis or some other organic complication. Of the sixty patients, 53 per cent gave a history of pneumonia and 35 per cent of pleurisy. Bronchostenosis is frequently mistaken for bronchopneumonia. Roentgenograms of the thorax may show an area of pneumonitis or atelectasis. After the acute phase subsides, bronchoscopic examination reveals a stenosed bronchus and dilatation by forceps introduced through the bronchoscope, and aspiration of the retained secretion usually relieves it. An adult or a child who has asthma and who experiences one attack or repeated attacks of "pneumonia" should be suspected of having had stenosis of a bronchus until proved otherwise. The physical signs which may accompany bronchostenosis are secondary to the atelectasis. They consist of suppression of breath sounds and fremitus over the affected area and dulness to percussion over the atelectasis. In uncomplicated asthma physical signs are equal in each lung. The x-ray observations of bronchostenosis are

usually those characteristic of atelectasis or, less frequently, bronchiectasis. Only a few patients with asthma require bronchoscopy, but it should be done as it will rule out or confirm the presence of bronchostenosis. In addition to bronchostenosis caused by localized inflammation, bronchostenosis referable to malignant changes complicating allergic asthma, as was found in one of the sixty cases, tuberculosis or ulceration of calcareous material may be possible. Almost every case of bronchostenosis complicating asthma may be traced to an acute infection of the respiratory tract. Postural drainage is important when bronchial secretions are in excess. Daily postural drainage will help to correct the stagnation of secretions that apparently contributes to the development and aid in preventing recurrences of bronchostenosis. In half of the authors' patients the asthma had an allergic basis. The immediate results (relief of the patient, subsidence of fever, reduction in amount and improvement in character of the sputum, improvement of the asthma and often immediate reversal of physical signs of bronchial obstruction) of dilation and aspiration are excellent.

Pharmacologic Treatment of Schizophrenia.—Katzenelbogen and his colleagues present their experience with the following aspects of insulin shock therapy of schizophrenia: sensitivity to insulin, reactions following individual injections, unusual reactions (hazards) during and following individual treatments, biochemical studies, electro-encephalographic studies and therapeutic results. 1. Both men and animals may be hyposensitive or hypersensitive to insulin. The amounts necessary to provoke shock or hypoglycemic reactions varied from 25 to 400 units. Tolerance to insulin may change throughout the treatment. 2. The most common vegetative system reactions, profuse perspiration and abundant salivation, are usually simultaneous. The cardiovascular system responds with marked fluctuations in the pulse rate. The respiratory system usually does not show significant changes in the precomatose phase of the treatment, but in the comatose state irregular, stertorous and deep heavy breathing is frequent. The body temperature more often than not goes down. General muscular relaxation or rigidity is frequent before and during the comatose state. Abolition of the corneal reflexes, weakening of the plantar reflexes or marked extension of the big toe are common during coma. The most dramatic reactions are excitement, motor restlessness, clonic convulsions and drowsiness. Usually each patient reacts along the same pattern throughout the treatments, but the quality, intensity, sequence and duration of the reactions may vary in different patients and in the same patient on different days. 3. Eight of the authors' 140 patients had unusual reactions: cardiovascular collapse, prolonged deep coma, apnea and cyanosis. Only one of these patients died. 4. Biochemical studies show that of the thirty-two variables analyzed in blood before the administration of insulin and during coma some showed changes during therapy beyond normal fluctuation and errors of the methods. Serum solids showed a tendency to increase, while the other blood constituents showed a definite decrease and then a trend toward the original level. Sugar and fermentable sugar diminish considerably and remain at a low level throughout the individual treatments. The blood sugar and inorganic phosphorus curves do not keep pace throughout treatment, the sugar curve remains low and the phosphorus rises gradually to the original level and in some cases above that level. The relationship between the hypoglycemia, the reactions and the dose of insulin are not qualitatively or quantitatively consistent. 5. The fifty brain action potentials studies in seventeen schizophrenic patients revealed two distinct types of "brain waves." In the first (in forty-two records) a fairly normal alpha rhythm, from eight to ten cycles per second, predominated during the earlier interval of recording. This was followed by a gradually steady decrease as the hypoglycemia progressed. Within a few hours of insulin injection a low frequency brain wave pattern averaging three cycles per second became predominant. There was a striking parallelism between the variations in the brain potentials and the changes in the blood sugar content. With intravenous dextrose the brain wave pattern often returned to its original preinsulin type within ten minutes; with gavage the return was longer but did not exceed thirty minutes. 6. Thirty-five of the patients were completely free from psychotic symptoms and made satisfactory adjustment outside the hospital. Twenty-five patients were improved to the extent that there was a markedly favorable change in their behavior, with satisfactory social adjustment in the hospital and under certain favorable circumstances outside the hospital. The remaining patients showed no change. Twenty-four of the patients with remissions had been affected one year or less.

Blood Pressure Studies of University Students.—Thacker studied blood pressure records of 15,000 male university students and tried to ascertain the effect of exercise on them from a comparative standpoint. A systolic blood pressure over 150 mm. of mercury on entrance was considered hypertensive and one below 108 hypotensive. Exercise tests were not performed by students with discernible organic heart, kidney or thyroid disease. The same type of exercise, consisting of raising the weight of the body twenty times from the floor on to a chair 18½ inches high at the rate of forty cycles per minute, was performed by all subjects. The comparative effect of exercise was studied on the ninety-six hypertensive, fifty-six hypotensive and 128 normal subjects on whom the cold pressor test had been conducted for vasomotor response. The systolic blood pressure of 20 per cent of the hypertensive students increased more than 60 mm. of mercury and in 2 per cent the increase was more than 80 mm. The systolic pressure in the normal group failed to increase more than 50 mm. in 82.7 per cent and in none did it rise more than 60 mm. In the low blood pressure group, 91.6 per cent failed to show an increase of more than 30 mm. and none more than 40 mm. The average increase of the systolic pressure was respectively 48, 37 and 23 mm. of mercury for the hypertensive, normal and hypotensive classes. The diastolic pressure decreased in all three groups; more than 91 per cent of the normal and hypotensive students and 79 per cent of the hypertensive subjects did not have more than a 10 to 20 mm. decrease. Only about 8.5 per cent of the normal and low pressure groups had a diastolic decrease of 21 to 30 mm. as compared to 18.7 per cent of the hypertensive subjects. Following exercise the systolic pressure of the normal group returned to the basal level within five minutes as compared to only 78.8 per cent of the high pressure group and 74.8 per cent of the low pressure group. The pulse rate following exercise of the normal and low pressure cases returned to the basal level within two minutes; the average for the hypertensive cases was three and one half minutes. The average pulse rate increase after exercise was respectively thirty, thirty-four and thirty beats per minute for the high, normal and low pressure groups. The increase in the blood pressure cannot be attributed to this factor alone, as in many subjects a marked increase in the systolic blood pressure existed with only a slight increase in the pulse rate, and vice versa. The maximal average systolic pressure after exercise in the hypertensive group rose 30 mm. above the ceiling reached when the cold test was used. The regular or usual systolic blood pressure in the hypertensive class was 28 mm. above the basal level as compared to 5 and 7 mm. in the low and normal groups. From a detailed history of the students it was observed that 11.7 per cent of the normal, 14.3 per cent of the low pressure and 43.7 per cent of the hypertensive groups presented evidence of being nervous or easily excited. Also 3.1 per cent of the normal and 5.3 per cent of the low blood pressure and 54.1 per cent of the hypertensive groups gave a history of familial hypertensive cardiovascular disease. Likewise 17.8 per cent of the hypotensive class gave a family history of low blood pressure, whereas none of the high blood pressure and only 2.3 per cent of the normal subjects indicated such a familial disturbance. Perhaps the definite hereditary pattern for blood pressure depends for the most part on some structural or physiologic phenomenon of the autonomic nervous system and/or endocrine function, which are passed through the germ plasm. Of the students in the high pressure group 35.4 per cent were heavy eaters, as compared to 14.8 and 14.3 per cent of the normal and low pressure subjects. The history of the amount of exercise or work done appears to be of little importance as a causative factor in the production of essential hypertension. The fallacy of one blood pressure test is revealed by the fact that 64.8 per cent of the students with a systolic pressure above 150 mm. at the time of their entrance physical examination had normal pressures at the first recheck, as were 82.2 per cent of the hypotensive subjects.

Archives of Pathology, Chicago

30:843-992 (Oct.) 1940

Changes in Number of Circulating Leukocytes in Relation to Spontaneous Recovery from Pneumococcic Infection: Experimental Animal Used, Guinea Pig. M. S. Fleisher and G. T. Rich, St. Louis.—p. 843.
Atherosclerosis: II. Lipids of Serum and Tissues in Experimental Atherosclerosis of Rabbits. S. Weinhouse and E. F. Hirsch, Chicago. —p. 856.
Phagocytosis of Collagen. G. A. Vassos Jr., New York.—p. 868.
Specificity of Fetal and Adult Human Hemoglobin Precipitins. Ruth Renter Darrow, Sophie Nowakovsky and Margaret Howard Austin, Chicago.—p. 873.
Microscopic Structure of Striated Muscle in Heat Rigor: Nodal Multiplication of Striae. E. J. Carey, Milwaukee.—p. 881.
Mitosis in Specimens Removed During Day and Night from Carcinoma of Large Intestine. W. B. Dublin, R. O. Gregg and A. C. Broders, Rochester, Minn.—p. 893.
Chemotaxis of Monocytes Contrasted with That of Polymorphonuclear Leukocytes and Lymphocytes. D. R. Coman, Philadelphia.—p. 896.
Intravital Staining of Malignant Neoplasms in Man by Evans Blue. A. Brunschwig, R. L. Schmitz and T. H. Clarke, Chicago.—p. 902.
Does Chronic Irritation Cause Primary Carcinoma of Human Lung? Madge Thurlow Macklin and C. C. Macklin, London, Ont.—p. 924.

Journal Industrial Hygiene & Toxicology, Baltimore

22:253-302 (Sept.) 1940

Hydrogen Cyanide Gas Fumigation. J. E. O'Donnell, H. W. Mundt, W. N. Knudsen and P. H. Delano, Fort Peck, Mont.—p. 253.
Settling Characteristics of Various Inorganic Dusts. L. H. Berkelhamer, Saranac Lake, N. Y.—p. 276.
Acute Response of Guinea Pigs and Rats to Inhalation of Vapors of Tetra-Ethyl Orthosilicate (Ethyl Silicate). H. F. Smyth Jr. and Jane Seaton, Pittsburgh.—p. 288.
Dermatitis Venenata Resulting from Contact with Aqueous Solution of Ethyl Mercury Phosphate. F. J. Vintinner, Concord, N. H.—p. 297.

New England Journal of Medicine, Boston

223:481-522 (Sept. 26) 1940

Treatment of Prostatic Obstruction. R. M. Nesbit, Ann Arbor, Mich. —p. 481.
Football: Review of Injuries in Boston Secondary Schools. J. H. Burnett, Boston.—p. 486.
*Treatment of Sydenham's Chorea by Fever and Vitamin B Therapy. S. Stone, Manchester, N. H.—p. 489.
Treatment of Pneumonia. M. Finland, Boston.—p. 499.

Fever and Vitamin B for Chorea Minor.—In view of the frequency of cardiac changes in chorea and the fear of untoward complications following eight hours' exposure of a child to a temperature of 104 F. or over, as recommended by Neymann, Stone reduced the fever time and increased the number of treatments. The factor of vitamin B deficiency was considered as a possible contributing cause in the development of cardiac involvement and the hyperirritability of the nervous system. The patient's diet was therefore complemented by the addition of vitamin B complex given orally, and in some cases by thiamine hydrochloride given intravenously. In the last three years the author has treated twenty children suffering from chorea. Seven patients exhibited all the signs of severe chorea, as manifested in continuous movement of the face and extremities, inability to feed or dress themselves, hypotonia and muscle weakness, and inability to walk without support. The other thirteen patients presented moderately severe or mild forms of the disease. A number of patients gave a history of an attack of severe chorea from three months to two years previously, from which they had apparently never completely recovered. The author's method of treatment for severe cases (an advanced cardiac condition was not found to be a contraindication to the treatment) consisted in giving the patient six or seven fever treatments, one every three or four days, and maintaining the temperature at 104 F. or over for about two hours. Every treatment was followed by the injection of from 10 to 15 mg. of thiamine hydrochloride intravenously shortly after removal from the fever cabinet, while the temperature still remained elevated. The patients received from 4 to 8 cc. of vitamin B complex orally three times daily. Recovery was produced with about fourteen hours of fever at 104 F. or over. When this was combined with vitamin B therapy, advanced cardiac conditions were found to be no contraindication to the fever treatment. Usually a change for the better in the carditis was noted at the end of the treatment. One of the two patients treated with thiamine hydrochloride responded with cessation of symptoms after the second intravenous injection of 10 mg. of the drug. Various degrees of behavior disturbances were seen in most of the moderately severe and milder cases. They all received from 4 to 8 cc. of vitamin B complex orally, three times a day. The improvement in physical manifestations was less rapid than it was in the fever-treated patients, but most of the symptoms disappeared within one month. No hospitalization was required for any patient in this group. Improvement was noted in their behavior concomitantly with the change for the better in the choreic manifestations.

New Orleans Medical and Surgical Journal

93:111-168 (Sept.) 1940

Problem of Prostatism. M. H. Foster, Alexandria.—p. 111.
Management of Chronic Prostatitis. C. O. Frederick, Lake Charles.—p. 115.
Treatment of Hyperplasia of Prostate with Diethylstilbestrol and Diethylstilbestrol Dipropionate: Preliminary Report. P. J. Kahle and E. Maltry, New Orleans.—p. 121.
Pulmonary Tuberculosis: Pathology and Pathogenesis. E. L. Burns, New Orleans.—p. 131.
Id.: Early Diagnosis from the Standpoint of the Pediatrician. E. Naef, New Orleans.—p. 136.
Id.: Early Diagnosis. M. W. Miller, New Orleans.—p. 139.
Studies with Antigens: V. Analysis of Comparative Skin Reactions by Means of the Chi Square Statistic. M. R. Pabst, C. H. Boatner and B. G. Efron, New Orleans.—p. 142.
Medical Societies of Louisiana Prior to the War Between the States. W. D. Postell, New Orleans.—p. 150.

Public Health Reports, Washington, D. C.

55:1707-1758 (Sept. 20) 1940

*Rheumatic Heart Disease in Philadelphia Hospitals: Study of 4,653 Cases of Rheumatic Heart Disease, Rheumatic Fever, Sydenham's Chorea and Subacute Bacterial Endocarditis Involving 5,921 Admissions to Philadelphia Hospitals from Jan. 1, 1930, to Dec. 31, 1934: III. Fatal Rheumatic Heart Disease and Subacute Bacterial Endocarditis. O. F. Hedley.—p. 1707.

Rheumatic Heart Disease in Philadelphia Hospitals.—According to Hedley, of 4,653 cases (5,921 admissions) of rheumatic heart disease, rheumatic fever, Sydenham's chorea and subacute bacterial endocarditis admitted to Philadelphia hospitals from Jan. 1, 1930, to Dec. 31, 1934, 21.9 per cent ended fatally. If subacute bacterial endocarditis apparently not superimposed on rheumatic heart disease is excluded there were 916 deaths, or 20.2 per cent, among the 4,538 cases. Of 3,445 cases of rheumatic heart disease, excluding all subacute bacterial endocarditis, 732, or 21.3 per cent, terminated in death. Subacute bacterial endocarditis apparently not engrafted on rheumatic heart disease was the cause of death in 104, and of the 916 fatal cases of rheumatic heart disease 901 were due primarily to rheumatic heart disease including deaths from subacute bacterial endocarditis when occurring as a complicating factor. The causes of the other fifteen deaths were due to various causes, including empyema, traffic accidents, operations and diabetes, but had this study been based on postmortem examinations rather than clinical observations this percentage of 1.6 would probably have been substantially increased. With one possible exception, in no instance was death attributable to the arthritic manifestations of rheumatic fever or the cerebral manifestations of Sydenham's chorea. The mean age at death from rheumatic heart disease, regardless of its association with subacute bacterial endocarditis, was slightly less than 30 years. The proportion of deaths from rheumatic heart disease in hospitals among Negroes was not as great as might be expected. This is probably influenced by the age distribution of the Negro population as a result of recent migration. Among the 916 deaths more than 63 per cent occurred during the 10 to 19, 20 to 29 and 30 to 39 decades; more than 50 per cent of deaths occurred among persons less than 30 years of age, while only 3 per cent occurred among persons more than 60 years of age. The studies do not suggest that deaths from rheumatic heart disease in Philadelphia hospitals are more common among foreign born persons or among persons of foreign extraction than among old stock white Americans; if anything, the opposite obtains. This is probably influenced by the readiness with which various racial groups avail themselves of hospital facilities, their economic status and the relative age of foreign groups dependent on the period of greatest immigration. Fatalities from rheumatic heart disease were disproportionately high among the laboring classes. There were few deaths among professional men. As the disease develops during childhood, persons with rheumatic heart disease are not as likely to engage in occupations requiring strenuous exertion as the social status of the laboring classes would suggest. Rheumatic heart disease causes approximately 200 deaths annually in Philadelphia hospitals;

165 are due primarily to rheumatic heart disease, while thirty-five are due to subacute bacterial endocarditis superimposed on rheumatic heart disease. In about 0.1 per cent of hospital admissions for all causes, death is due to rheumatic heart disease. The mean age at onset was 14.7 years, the mode 9.3 years. The mean interval between the primary manifestation and death was 13.4 years. Among 542 fatal cases in which the duration from onset to death was ascertained, death resulted in less than one year in 13.5 per cent, in less than five years in nearly 32 per cent and in less than ten years in more than 48 per cent. At least from 3.5 to 4.5 per cent of first attacks terminated fatally. This percentage becomes higher if deaths from fulminating rheumatic carditis without arthritic manifestations of rheumatic fever are included. Despite the preeminence of Philadelphia as a medical center, the problem is a local one as at least 87.2 per cent of fatal cases were among residents. The mean annual death rate from rheumatic heart disease in hospitals among Jewish persons was approximately the same as among Gentiles. Of 116 pregnant women with rheumatic heart disease, 18.1 per cent died.

Southern Medical Journal, Birmingham, Ala.

33:1015-1116 (Oct.) 1940. **Partial Index**

Hysterectomy: Review of 1,000 Consecutive Hysterectomies at St. Anthony Hospital, Oklahoma City. W. Long, W. B. Poole, Oklahoma City, and T. J. Hardman, Tulsa, Okla.—p. 1015.
Indications and Contraindications for Cesarean Section. J. E. Kanatser, Wichita Falls, Texas.—p. 1023.
Radiation Therapy in Treatment of Metastatic Malignancy of Chest. R. G. Giles, San Antonio, Texas.—p. 1033.
Common Vesicular Lesions of Hands and Feet: Diagnosis and Treatment. C. B. Kennedy, New Orleans.—p. 1036.
Treatment of Severe Staphylococcic Infections with Sulfapyridine and Its Sodium Salt. W. B. Martin and R. B. Grinnan Jr., Norfolk, Va.—p. 1039.
The Genesis of Pellagra. S. Harris, Birmingham, Ala.—p. 1044.
Some Uses of Vitamin B_1 in Neurology and Psychiatry. J. A. Willie, Oklahoma City.—p. 1056.
Effects of Foods and Drugs on Cataracts. T. W. Moore, Huntington, W. Va.—p. 1060.
*Night Blindness and Vitamin A Deficiency in Pulmonary Tuberculosis. R. Harris and J. S. Harter, Jackson, Miss.—p. 1064.
Follow-Up on Craniocerebral Injuries. J. Greenwood Jr., Houston, Texas.—p. 1077.
Treatment of Chronic Urticaria: Based on Successful Outcome of Seventeen Out of Eighteen Cases. I. S. Kahn and Emma M. Grothaus, San Antonio, Texas.—p. 1086.
Influence on Public Health Progress of Inadequate Medical Services in the Rural Population. C. B. Crittenden and Lois Skaggs, Louisville, Ky.—p. 1092.
Similar Fibroid Tumors Occurring in Identical Twins. G. Walsh and R. M. Pool, Fairfield, Ala.—p. 1098.
Standardization of Medical Schools: Origin and Present Day Application of the Program. F. C. Zapffe, Chicago.—p. 1100.

Night Blindness, Vitamin A Deficiency and Tuberculosis.—Harris and Harter studied the photometer readings of 114 ambulant institutional patients with pulmonary tuberculosis. The tests showed about an equal deficiency in vitamin A in the few newly admitted patients so studied. The diet in this institution has been carefully worked out and contains everything necessary to a point of luxury. The minimal reading of 0.6 was regarded as normal, from 0.6 to 2 as pathologically borderline and more than 2 millifoot candles as unmistakably pathologic. Of the patients tested, fifty were pathologic at the first test, sixty-one were borderline and three were normal. At the end of one week each patient having had 30,000 units of halibut liver oil daily, of thirteen pathologic cases tested eight were still pathologic and five borderline. At the end of three weeks, on the same dosage, nineteen of the originally pathologic patients were tested: four were still pathologic and fifteen fell in the borderline class. Of twenty-five originally pathologic patients tested after having been on 30,000 vitamin A units of halibut liver oil for two months, three were normal and twenty-two were high borderline. At the end of five months, of fourteen tested five were normal and nine very high borderline. Thirty-five of the originally pathologic patients were discharged before the end of five months. The author concludes that marked vitamin A deficiency in any individual might indicate that a thorough chest examination is in order if no other cause is found for the deficiency. Large doses of halibut liver oil may be necessary. Fifty and more years ago pulmonary tuberculosis was treated with cod liver oil and the physicians of that time were positive that it helped. Vitamin A in large doses may offer a worthwhile treatment in ocular tuberculosis.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

52:233-288 (Aug.-Sept.) 1940

Notes on Scleroderma (Dermatomyositis). T. Lewis.—p. 233.
Generalized Sclerodermia. G. B. Dowling.—p. 242.

British Journal of Ophthalmology, London

24:421-468 (Sept.) 1940

Some Observations on Present Position of Our Knowledge of Intra-Ocular Fluid. S. Duke-Elder, J. C. Quilliam and H. Davson.—p. 421.
Experiments on Effect of Ascorbic Acid in Mustard Gas Burns of Eye. Ida Mann and B. D. Pullinger.—p. 444.
Boeck's Sarcoidosis of Lacrimal Gland. H. B. Stallard.—p. 451.
Chronic Granuloma of Lacrimal Sac: Case. H. B. Stallard.—p. 457.

British Journal of Urology, London

12:161-220 (Sept.) 1940

Injuries of Kidney. R. H. J. Swan.—p. 161.
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British Medical Journal, London

2:373-404 (Sept. 21) 1940

*Spontaneous Hyperventilation Tetany. F. S. Fowweather, C. L. Davidson and L. Ellis.—p. 373.
Insulin Treatment of Pulmonary Tuberculosis. G. Day.—p. 376.
Lead Encephalopathy Simulating Cerebral Tumor. A. M. Nussey and I. Drybrough-Smith.—p. 379.
*Sulfanilamide as Preservative in Stored Blood. R. F. Hunwicke.—p. 380.
The War as an Etiologic Factor in Psychiatric Conditions. W. S. Maclay and E. Guttmann.—p. 381.

Spontaneous Hyperventilation Tetany.—Fowweather and his co-workers have encountered five cases of spontaneous hyperventilation tetany. The serum calcium was determined as a routine measure in each of them and in four the serum inorganic phosphorus. In three the phosphorus was in the neighborhood of 1 mg. per hundred cubic centimeters of serum. The authors believe this figure to be much lower than previously reported in this type of case. The results in these three cases are so definitely below the normal range as to be of valuable diagnostic significance, making phosphorus determination a useful addition to the methods of diagnosis. The specimens of blood were taken immediately after an attack. The serum calcium in four of the cases was at a high normal level, while in the fifth it definitely exceeded the normal. The three patients whose blood was examined when they were free from attacks gave figures below those obtained just after an attack. The first three patients had attacks of tetany during the course of another illness, which may well have been a contributing factor in the production of the tetany or a precipitating cause of the attacks. Spasmodic attacks were the major complaint of the other two patients. Both patients were obviously of neurotic type—one "full of complaints" and the other giving a history of hysterical fits. To the authors the most probable explanation of spontaneous hyperventilation tetany appears to be as follows: As a result of certain stimuli—physical or emotional—some individuals respond by overbreathing. If this is sufficient to reduce the carbon dioxide concentration in the blood, alkalosis will follow and in its turn may be sufficient to cause an attack of tetany. The attack is mainly due to tissue alkalosis and ends spontaneously, largely as a result of the tendency to tissue acidosis consequent on the muscular activity of the tetany itself. Cessation of overbreathing also occurs and assists in the return to normal conditions. The principal factor is the tendency to overbreathe among those of emotionally unstable temperament, sufferers from anxiety neuroses and the like. The tendency may be influenced by physical factors. Other factors which probably play some part are the state of the acid-base equilibrium when the overbreathing takes place and the susceptibility of the subject to alkalosis and its effects. Conditions other than tetany which have been associated with hyperventilation have been described under the terms "neurocirculatory asthenia" and "effort syndrome." Therefore alkalosis resulting from spontaneous hyperventilation may cause either tetany or the conditions referred to. What determines the actual clinical manifestations in any given case is not apparent. However, (1) effort syndrome and related conditions without tetany are

rarely, if ever, seen as a result of voluntary overbreathing in normal individuals, (2) in spontaneous tetany resulting from hyperventilation and sometimes in the tetany induced by voluntary overbreathing in normal persons many of the symptoms (breathlessness, dizziness, faintness, palpitation, tremor) associated with effort syndrome and the like are also present but tend to be overshadowed by the tetanic spasms and (3) in cases of spontaneous hyperventilation tetany, effort syndrome and the like there is a background of anxiety, emotional stress or other psychologic disturbance.

Sulfanilamide as Preservative for Stored Blood.—Hunwicke confirms the experiments of Novak that sulfanilamide in comparatively low concentrations has a preservative effect on blood stored at refrigerator temperatures. Novak recommends the addition of 20 mg. of sulfanilamide to 100 cc. of blood. In one of the experiments reported by Hunwicke this did not prove adequate. The use of higher concentrations, say up to 1:1,000, would seem to offer a solution of the problem, provided the initial contamination is negligible. When complete sterility is achieved there is no need for any addition to the blood, but this is a rare condition as usually there are a few organisms present which do not reveal themselves until the blood has been in the refrigerator for some days or weeks, when they begin to multiply. It is to guard against wastage of blood and the possible consequent danger of heavy contamination that the addition of sulfanilamide is suggested. The sulfanilamide must be added to the blood in concentrated sterile solution. The solution when added to the blood must be still warm, that is before crystallization begins.

South African Medical Journal, Cape Town

14:291-310 (Aug. 10) 1940

The Epileptic and His Treatment. M. J. Cohen.—p. 293.
Radiologic Signs of Gastroduodenal Ulcers. S. Ferreira.—p. 294.

Chinese Medical Journal, Peiping

58:1-140 (July) 1940

Studies on Mechanism of Insulin Convulsions: I. Significance of Serum Electrolytes: II. Effects of Breathing Atmospheres Varying Widely in Oxygen and Carbon Dioxide Content. I. McQuarrie, M. R. Ziegler and W. E. Stone.—p. 1.
Id.: Effects of Varying Partial Pressures of Atmospheric Oxygen and Carbon Dioxide in Adrenalectomized Animals. I. McQuarrie, M. R. Ziegler, W. E. Stone, O. H. Wangensteen and C. Dennis.—p. 26.
*Immunization Against Whooping Cough: I. Controlled Study of Prophylactic Vaccination in an Orphanage. F. T. Chu and J. P. Wu.—p. 39.
Metabolic Studies on Roasted Soybean Meal as Infant Food. C. Fan, Theresa T. Woo and F. T. Chu.—p. 53.
Acute Encephalitis in Children: Clinical and Serologic Study of Ten Epidemic Cases. F. T. Chu, J. P. Wu and C. H. Teng.—p. 68.
Involvement of Nervous System in Mumps. I. Snapper.—p. 79.
Muscular Dysfunction in Glycogen Storage Disease. C. Fan and Theresa T. Woo.—p. 88.
Note on White Blood Cell Counts in Whooping Cough. C. T. Ch'in.—p. 98.
Growth and Development of Chinese Infants of Hunan Province: I. Body Weight, Standing Height and Sitting Height During First Year of Life. T. F. Su and C. J. Liang.—p. 104.
Tuberculosis in Children in Shanghai. C. L. Kao.—p. 113.

Immunization Against Whooping Cough.—Chu and Wu observed the effect of active immunization of thirteen children against whooping cough during an epidemic in a local orphanage. The thirteen children were inoculated at weekly intervals for three weeks with vaccine prepared from phase I organisms. About five months after the completion of the vaccination of these thirteen children whooping cough appeared at the institution. Facilities for the isolation of the orphanage children were entirely lacking. Of the thirteen children vaccinated prior to the outbreak none developed the disease in spite of continuous and prolonged exposure. On the other hand typical pertussis developed in twenty-three, or 67.6 per cent, of thirty-four non-vaccinated children whose age, mode of living and degree of exposure were the same as those of the vaccinated children. The serum agglutinin titer for Haemophilus pertussis increased during the course of the epidemic in seven of the vaccinated children, indicating clearly that they had been exposed. The remaining six vaccinated children likewise showed increased agglutinin titers, but they had been given an additional dose of vaccine during the early part of the epidemic. The authors are convinced of the effectiveness of the method for preventing pertussis.

Note e Riviste de Psichiatria, Pesaro

69:115-244 (April-June) 1940

*New Prophylaxis Against "Protracted Coma" in Insulin Shock Therapy. F. Accornero and A. Giordani.—p. 115.
Treatment of Colibacillary Psychoses. D. de Rosa.—p. 149.
Homosexuality. A. Cucchi.—p. 173.
Mechanism of Convulsivant Action of Acetylcholine Intravenously Administered. A. Rossi.—p. 183.
Clinico-Anatomic Observations of a Case of Alzheimer-Perusini Disease. G. Fattovich and Cecilia Cavagna.—p. 209.

Prevention of Prolonged Coma in Insulin Shock Therapy.—Accornero and Giordani report the successful use of 1-phenol-2-methylaminopropanol in preventing prolonged coma in eleven selected cases of dementia praecox (six of which were of the paranoic type) after insulin shock treatments. The drug, added to the sugar solution and administered by means of a stomach tube in doses varying from 6 to 12 mg., was able to reduce coma to periods varying from ten to twenty-five minutes in patients who previously had been observed to require fifty minutes and even six and a half hours to recover consciousness. Though given daily for as long as two months in high doses, the drug was well tolerated and elicited no untoward effects. Their three year experience with the drug proved that it had to be given in combination with the sugar solution. Delayed administration not only lowered efficacy but tended to negative results. The authors point out that in no case was prolonged shock due to overdosage with insulin. Prolonged shock, they believe, is likely to occur even when all precautions have been observed because of the variability of effect of the same dosage in the same person on successive days due to hypoglycemic fluctuation or to retarded absorption of the carbohydrates under the influence of excessive acidity of the gastric juice. They recommend that the drug be used to prevent prolonged coma in persons known to have a tendency to revive slowly rather than that it be relied on as a means to interrupt protracted coma after it has already set in.

Lisboa Médica, Lisbon

17:423-480 (July) 1940. **Partial Index**

*Identification of Trichomonas Vaginalis in Leukorrheas. A. B. Corrêa Mendes.—p. 432.
Waterhouse-Friderichsen's Syndrome: Case. Silva Nunes.—p. 459.

Trichomonas Vaginalis in Leukorrhea.—Corrêa Mendes made a comparative study of stained dried smears of either fresh or dry vaginal secretions and microscopic preparations of fresh vaginal secretions of 120 women with leukorrhea. Microscopic preparations were made with the vaginal secretion in physiologic solution of sodium chloride. The smears were prepared by the "roll film" method, allowed to dry, fixed by heat and stained by Jensen's modification of Grams method. The results of the two methods agreed in 116 cases, there being thirty-five positive results for Trichomonas and eighty-one negative results. In four cases Trichomonas was identified by the dried staining method alone, after failure of fresh microscopic preparations. The author believes that the methods of stained dried smears and of microscopic preparations of fresh vaginal secretion have the same diagnostic value in identifying Trichomonas vaginalis. The practical value of the smear method is greater than that of preparations of fresh secretion. Bacteria other than Trichomonas may be identified. In cases of Trichomonas infection reported by the author, the vaginal secretion did not contain Döderlein's bacilli. The vaginal bacterial flora corresponded to that of the third degree of Cruickshank and Sharman's classification. Control of protozoal infection resulted in a modification of the bacterial flora to the type which corresponds to the first degree of Cruickshank and Sharman's classification. Trichomonas was present in association with gonorrhea in three cases, with eumicetes in two and with spiriles in three cases. The vaginal secretion of twelve pregnant women contained eumicetes alone or in association with vibrios in the absence of Trichomonas. Trichomonas is identified in dried stained smears by the appearance of the protoplasm and by the position of the nucleus and the presence of stained flagella. The protoplasm is granular and foamy. The nucleus appears as an elongated mass uniformly stained red in the proximal end of the protozoon near the point of insertion of flagella, which usually, though not necessarily, takes the red stain.

Medical Library

Zeitschrift für Tuberkulose, Leipzig

85:1-64 (June) 1940

*Special Apparatus for Endoscopic Examination of Tuberculous Patients and for Intracavernous Aspiration Technic According to Monaldi. J. Abelló.—p. 1.
Suction Drainage in Treatment of Residual Caverns. W. Kremer.—p. 11.
Cure of Congenital Giant Cyst of Lung. H. Brügger.—p. 14.
Extensive X-Ray Shadows in Children with Tuberculosis. Hanna Fischer.—p. 18.
The Tuberculous Patient at Work. E. Brandt.—p. 24.

Endoscopic Examination and Monaldi's Intravenous Aspiration.—Abelló, in discussing the technic of Monaldi's intracavernous aspiration (see abstract in THE JOURNAL March 9, 1940, p. 934) and the instruments used for this procedure, describes an instrument developed by him which enables one to inspect the interior of a cavity. The basic idea of the instrument is the use of the thoracoscope in connection with the Monaldi method. He designates his instrument as a cavernoscope or pleurothoracoscope. The instrument has the diameter of a No. 12 Nelaton catheter. The upper end of the lamp is constructed like Bottari's trocar and thus the thoracoscope can serve as a trocar. The instrument is introduced with the lamp lighted. In order to prevent the prism becoming clouded at the time it enters the cavity it is passed over an alcohol flame. The apparatus can also be used to close the drainage bronchi by means of diathermy. The author gives detailed description of the practical application of his method. Following roentgenologic localization of the cavity a Saugman needle is introduced at the most favorable point. The trocarthoracoscope is then introduced by the same course as the needle. Following inspection of the cavity, the cavernoscope is withdrawn and replaced by a rubber tube. The cavity should be entered, if possible, 2 or 3 cm. above the base, for if it is entered near the base it becomes easily stopped up. The position of the tube must be controlled by x-ray examination. Since coughing may cause misplacement or even expulsion of the tube, it should be attached to the wall of the thorax. The author advises twenty-four hours of rest before aspiration is begun.

Sovetskaya Meditsina, Moscow

Pp. 1-52 (Nos. 13-14) 1940. **Partial Index**

More Data on Curative Value of Conserved Tissue. V. P. Filatov.—p. 5.
Treatment of Gunshot Wounds. B. E. Linberg.—p. 8.
Wounds of the Lung and Pleura. M. A. Ariev.—p. 11.
Treatment of Suppurating Wounds with Cold Quartz Lamp. D. K. Yazykov.—p. 14.
Methyl Violet Therapy of Burns. D. M. Rapoport.—p. 15.
*Procaine Hydrochloride Block of Vishnevskiy for Spontaneous Gangrene and Trophic Ulcers. L. M. Shnaper.—p. 26.
*Nicotinic Acid Therapy in Pellagra of Children. P. S. Gershenovich, A. M. Maksudov and Ts. G. Ioffe.—p. 29.

Spontaneous Gangrene and Trophic Ulcers.—Shnaper treated fifteen cases of spontaneous gangrene of the extremities, twelve cases with trophic ulcers, two cases with circulatory disturbances due to chilblain and one case due to a snake bite. The patients with spontaneous gangrene complained of excruciating pain in the extremity, intermittent claudication, coolness and cyanosis of the extremity with the development of gangrene of the toes or the entire extremity. As a rule there was no pulsation in the dorsal pedal artery and in some of the cases in the popliteal. All the patients had been previously submitted to a number of medical and surgical procedures without success. The treatment consisted of a circular procaine hydrochloride block according to the method developed by Vishnevskiy. From 200 to 225 cc. of a 0.25 per cent of procaine hydrochloride solution was slowly injected into the skin and subcutaneous tissue and below the aponeurosis in a circular fashion above the lesion. This procedure was followed by a mild rise in temperature, normal sleep and disappearance of pain within the first twenty-four hours. The pain returned after this period but was much less intense and disappeared gradually in from two to five days. The affected extremity became warmer and a line of demarcation rapidly developed in cases exhibiting beginning gangrene of toes or fingers. In some of the cases the circular block was supplemented within three weeks by a lumbar block (injection of from 75 to 100 cc. of procaine hydrochloride solution into the right or left lumbar region). The favorable effect was observed for periods of from one and one half to two years. The rationale of the treatment is based on Speranskiy's theory that local irritation involves the central nervous system with the resulting upset in the normal internervous relations. He proposed the method of treating trophic lesions by interrupting the conduction of painful reflexes.

Nicotinic Acid Therapy in Pellagra of Children.—Gershenovich and his associates treated children with pellagra of the ages from 1 to 13 years in the pediatric clinic of Tashkent. The severe cases of pellagra presented clinical manifestations on the part of the skin, the gastrointestinal tract, the tongue and the nervous and psychic spheres. Children with subclinical pellagra presented diarrhea, lasting from two to six months and not yielding to ordinary dietetic therapy, marked dystrophy, asthenia, dryness of the skin and disturbances of pigmentation. The greater majority of the cases presented characteristic pellagrous glossitis with redness and erosions. The advanced pellagrins appeared emaciated, asthenic and apathetic and suffered from severe diarrhea and total anorexia. Nicotinic acid was administered intramuscularly in in a 1 per cent solution in distilled water in doses of 1 cc. for a child aged 1 year, 2 cc. for a child aged 2 years, 3 cc. for a child aged 3 years, 4 cc. for a child aged 4 years, 5 cc. for children of ages from 5 to 10 years and from 6 to 8 cc. for children above that age. The injections were given daily, in some cases twice a day. From ten to fifteen injections were necessary to accomplish a cure. Among the accompanying reactions the authors noted hyperemia of the tongue, face, neck and the upper half of the thorax, developing shortly after injection of nicotinic acid and lasting from a few minutes to several hours. All the patients without exception had a normal appetite after from three to four days of treatment. The tongue became normal after from five to six days or earlier. There was cessation of vomiting and gaining of weight in every case. The authors had never observed such a striking gain in weight in pellagra under any other therapy. The effect of the nicotinic acid therapy on the subclinical cases was likewise manifested by a rapid return of the appetite, arrest of diarrhea, improvement in the general condition and a normal appearance of the tongue. The authors conclude that nicotinic acid possesses a powerful specific curative effect on both the well marked and the so-called subclinical cases of pellagra.

Acta Medica Scandinavica, Stockholm

104:527-607 (Aug. 27) 1940

Parallel Investigations into Ascorbic Acid (Vitamin C) Content in Blood Plasma and into Strength of Cutaneous Capillaries in Healthy Children. N.-G. Ahlborg and G. Brante.—p. 527.
Megalocytic Anemia in Case of Jejunal Ulcer with Fatal Perforation. F. F. P. Weber and H. Huber.—p. 543.
Experimental Chronic Hepatitis (Cirrhosis) Based on Infection. T. T. Andersen and S. Tulinius.—p. 550.
Treatment of Rheumatism with Artificially Ionized Air. A. L. Tchijevsky.—p. 561.
Acute Leukemia and "Achrestic" Anemia in a Brother and Sister. J. Bichel.—p. 578.
*Hyperthyroidism After Weight-Reducing Thyroidin Treatment. W. T. Andersen.—p. 589.

Hyperthyroidism After Use of Thyroidin for Reducing.—Andersen reports three cases of hyperthyroidism following the use of thyroidin for reducing which were observed at a Copenhagen hospital in the course of one year. The three patients were women past the menopause and all had received energetic treatment with thyroidin. They were hospitalized with severe signs of thyrotoxicosis and auricular fibrillation. The treatment proved more difficult than usual; only two could be brought into a condition suitable for operative treatment. In the third case, however, spontaneous improvement appeared about a year after the onset. Of the cases in which surgical treatment was employed, only one showed a fairly satisfactory response. The hypothesis is advanced that the protracted administration of thyroid might produce a dysfunction of the hypophysis with increased production of the thyrotropic hormone, so that these cases represent a hypophysial rather than a thyrogenic hyperthyroidism. This view seems to be supported by the fact that the enlargement of the thyroid was slight in all three cases and that they were strikingly refractory to the usual treatment. The uncommonly malignant character of the reported cases convinced the author that extreme caution is necessary in the use of thyroid preparations for reducing.